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IN THE

Supreme Court of the United States

October Term, 1977.

No. 77-75

SYSTEMATIC TOOL & MACHINE COMPANY, et al.,

Petitioners,

v.

WALTER KIDDE & COMPANY, INC.,

Respondent.

PETITION FOR WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE THIRD CIRCUIT.

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—

Systematic Tool & Machine Company, et al.[1] (hereinafter referred to as "Petitioners") pray that a Writ of Certiorari issue to review the Judgment of the United States Court of Appeals for the Third Circuit entered in the above entitled civil action on March 25, 1977.

I.

OPINIONS BELOW.

The Opinion of the United States Court of Appeals for the Third Circuit (1a-21a)[2] has not as yet been reported.[3] The two Opinions of the United States District

1. Petitioners are Systematic Tool & Machine Company (a partnership) that was absorbed by a corporation Systematic, Inc. which was formed prior to institution of this suit on February 14, 1969. Other Petitioners are Clayton Giangiulio and Dominic D'Ambro, all of whom were Plaintiffs in the District Court and Appellees in the Court of Appeals.

2. Reference to the Appendix filed concurrently with this Petition is by page number, followed by the letter "a".

3. This includes the dissenting Opinion of Circuit Judge Rosenn.

Court for the Eastern District of Pennsylvania (25a-147a) are reported at 390 F. Supp. 178 and 409 F. Supp. 511 (E. D. Pa. 1975 and 1976).

II.

JURISDICTION.

The Opinion and Order of the United States Court of Appeals for the Third Circuit was entered on March 25, 1977. Petitioners filed a timely request for Rehearing In Banc at the Court of Appeals on April 7, 1977 (22a) which Petition was denied by the Court of Appeals on April 28, 1977 (23a). The twenty-one day pendency of the Petition for Rehearing In Banc before the Court of Appeals is to be added [4] to the ninety-day period allowed by 28 U. S. C. § 2101(c). See 9 Moore's Federal Practice § 201.03 [3.2]. The jurisdiction of this Court is invoked under 28 U. S. C. § 1254(1).

III.

QUESTIONS PRESENTED.

1. What is the role of Synergism in evaluating the validity of a patent with reference to the determination of non-obvious subject matter within the meaning of 35 U. S. C. 103?

2. Where the District Court twice found that the invention of the patent in suit achieved a synergistic result, was it proper for the Court of Appeals to relegate the findings of synergism to the status of merely one factor to consider in determining obviousness, which finding of synergism is outweighed by conclusionary partisan testimony of Respondent's expert that had been rejected by the District Court?

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4. *United States v. Adams*, 383 U. S. 39, 41 (1966).

IV.

CONSTITUTIONAL PROVISION AND STATUTE INVOLVED.

The constitutional provision involved is Article 1, Section 8, which reads as follows:

> "The Congress shall have the power . . . To promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writing and discoveries."

The Statute involved is 35 U. S. C. § 103 which reads as follows:

> "A patent may not be obtained though the invention is not identically disclosed or described, as set forth in Section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made."

V.

STATEMENT OF THE CASE.

In 1969, Petitioners filed suit in the Northern District of Illinois against Respondent and others for infringement of Giangiulio Patent No. 3,369,582 (copy attached hereto) entitled "Tomato Slicer". On Motion of Respondent the suit was transferred to the Eastern District of Pennsylvania with the action against the others being stayed.

Respondent initially sold a first type of accused tomato slicing machine known as the TK-I machine, the sales of which ceased in 1968. Respondent has stipulated that the TK-I machine infringes Petitioners' Patent, if valid.

During the period of 1968 to 1972 Respondent sold a second type of tomato slicing machine which is known as the TK-II machine. Petitioners' tomato slicer is known as the "Tomato Tamer".

After a non-jury trial, the District Court rendered an Opinion dated February 21, 1975 (25a-126a) holding Petitioners' Patent to be valid and finding that the TK-II tomato slicer, as well as the TK-I tomato slicer, infringes upon Petitioners' Patent. The Order of the District Court of February 21, 1975 allowed Respondent to file exceptions, which in fact were filed. The District Court, in a second Opinion, dated March 19, 1976 (127a-147a) denied the Respondent's exceptions and affirmed and readopted the earlier Findings of Fact and Conclusions of Law relating to validity and infringement of Petitioners' Patent. The District Court entered another Order on April 28, 1976 denying without prejudice, Injunctive Relief, in view of Respondent's cessation of infringing activities in 1972.

Of particular interest is the fact that the District Court twice found (74a, 76a) that Petitioners' invention had

achieved a *synergistic result*. This is significant not only because of what the District Court found, but also because of the timing, namely, the District Court's finding of *synergism* are to be found in an Opinion, dated February 21, 1975 which *predates* this Court's substantive reliance on synergism in *Sakraida v. Ag Pro, Inc.*, 425 U. S. 273, 79 S. Ct. 1532, 1537 (1976).

The Court of Appeals for the Third Circuit (1a-21a), in a 2-1 decision reversed[5] the District Court on the ground that the subject matter of Petitioners' patent and the prior art is obvious under 35 U. S. C. 103. The Court of Appeals based its reversal entirely on the testimony of Respondent's expert witness, which expert testimony had been *expressly rejected* by the District Court. The Court of Appeals not only placed overwhelming reliance on the testimony of Respondent's expert witness, but concluded that such testimony superseded the careful analysis of the prior art by the District Court.

The Court of Appeals added insult to injury by relegating the District Court's holdings of *synergistic* result (16a) to the junior status of one factor to consider in determining obviousness.

The net result of the analysis of the Court of Appeals is that it concluded that the testimony of Respondent's partisan expert outweighed not only the District Court's findings of synergism, but also the secondary tests of validity set forth by this Court in *Graham v. John Deere Co.*, 318 U. S. 1 (1966). The District Court found as facts that the patented invention enjoyed substantial commercial success, filled a long-felt need, failure of others and copying. A Petition for Rehearing In Banc was denied.

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5. Circuit Judge Rosenn filed a dissenting opinion (16a-21a) on the ground that the case should be remanded to the District Court for further findings with reference to the level of ordinary skill in the art.

It is thus seen that every *objective standard* set forth by this Court in determining validity has been met by the invention covered by the patent in suit. However, the Court of Appeals has chosen to virtually disregard the findings of fact concerning these standards, and instead has set as its standard of validity the subjective test of the opinion of a paid partisan expert.

VI.

REASONS FOR GRANTING THE WRIT.

1. The District Court's Finding of Synergism Creates a Strong Presumption of Non-Obviousness Under 35 U. S. C. 103.

This case should be reviewed on Certiorari because it involves important questions of national interest with reference to the meaning of Article 1, Section 8 of the Constitution which empowers Congress to promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries.

The historic starting point for an analysis of the law of patent validity is *Hotchkiss v. Greenwood*, 11 How. 248, 267 (1851) which establishes the legal test of patent validity as requiring ingenuity and skill beyond that possessed of an ordinary mechanic acquainted with the business.

The foregoing test was refined in *A & P Co. v. Super Market Corp.*, 340 U. S. 147, 152 (1950) wherein this Court stated:

> "Courts should scrutinize combination patent claims with a care proportioned to the difficulty and improbability of finding invention in an assembly of old elements . . . A patent for a combination which only unites old elements with no change in their respective functions . . . obviously withdraws what already is known into the field of its monopoly and diminishes the resources available to skillful men . . ."

In 1952 Congress enacted the present patent statute (Title 35, United States Code) and for the first time included in the patent statutes a test of patent validity in

Section 103 which was explained in *Graham v. John Deere Co.*, 383 U. S. 1, 17 (1966):

> "Under 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved."

Graham v. John Deere Co., supra, also set forth the significance of the secondary tests as follows at 383 U. S. 694.

> "Against this background, the obviousness or non-obviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or nonobviousness, these inquiries may have relevancy."

The most recent interpretation of 35 U. S. C. 103 by this Court is to be found in *Sakraida v. Ag Pro, Inc.*, 425 U. S. 273 (1976). In *Sakraida* the District Court had held the patent invalid, but the Court of Appeals reversed on the ground that the patented invention achieved a *synergistic* result. This Court however reversed the judgment of the Court of Appeals and reinstated the invalidity judgment of the District Court by holding at 96 S. Ct. 1537:

> "We cannot agree that the combination of these old elements to produce an abrupt release of water directly on the barn floor from storage tanks or pools can properly be characterized as synergistic, that is, result [ing] in an effect greater than sum of the several effects taken separately."

In the case at bar the Court of Appeals accepted the finding of the District Court as to the existence of a synergistic result and even deemed Petitioners' invention to be a "synergistic combination of known elements".[6] However, the Court of Appeals relegated synergism in the case at bar as being simply one factor to consider in determining obviousness. In *Sakraida* this Court defined synergistic as resulting in an effect greater than the sum of the several effects taken separately. As such, a *synergistic* result or *synergistic* combination at least gives rise to a *strong presumption* of non-obviousness.

Stated another way, the bringing together of a combination of old elements to achieve a synergistic result which is greater than the sum of the individual components by themselves, strongly suggests non-obviousness, particularly, as in the case at bar, when there are the secondary factors of commercial success, filling a long-felt need, failure of others and copying.

2. Petitioners' Invention and the Synergistic Result.

Since Thomas Jefferson first popularized the eating of tomatoes, the prevalent practice has been to slice tomatoes using an ordinary knife. The myriad of vegetable and fruit slicers for apples, potatoes, onions and lettuce, simply do not satisfactorily perform the task of slicing tomatoes.

As noted by the District Court in Finding No. 11 (38a) tomatoes possess the peculiar feature of a very tough outer skin and a soft, virtually structureless interior which contrasts sharply with food such as onions or apples. The special and unique properties of tomatoes are specifically recited in Columns 1 and 4 of Petitioners' patent (attached to this brief).

As further noted by the District Court (39a) typical existing slicing machines force the blades through the fruit with pressure build-up occurring in the tomato and then

6. 16a.

explode the tomato or shred the skin. Further pressure on a damaged tomato would squash it.

However, Petitioners' invention is not only the first successful tomato slicer, but it enables tomato slicing to occur at *high production rates* which constitutes the synergistic result of the invention.

In particular, the Petitioners' invention effects a movement of the tomato through blades at an angle of less than 40°, with the angle between the leading pusher arm (which holds the tomato) and the cutting edge of the blades being less than 90° and the trailing arm angle being a small acute angle. These features can be observed in Figure 1 of Petitioners' patent with particular emphasis on one arm 34a which is generally perpendicular to blades 24 and the other arm 34a that extends generally in the same direction as the blades 24. It is the combination of the movement of the tomato through blades 24a at an angle of less than 40° and different forcing actions of the arms 34a which "insures that the tomato is fully pushed through the blades to the other side" (column 4, line 70 of the patent).

By virtue of the foregoing combination (not found in the prior art) Petitioner's invention achieves the *synergistic* result of slicing tomatoes at a rate at least ten times greater than the prior art.

The foregoing synergistic result is absolutely confirmed by *Respondent's* own trade literature (copy of which is attached to this Brief), as well as the testimony of the inventor (7a). With reference to Respondent's trade literature, Respondent claims "slices whole tomatoes perfectly in one second". This constitutes a production rate of sixty sliced tomatoes per minute as compared with a rate of six tomatoes per minute for the only prior art patent in the record which is intended to slice tomatoes. The Court of Appeals did not even expressly cite this patent (Birambeau), but rather made an oblique reference to a

bun slicing patent (Bever) and to a general food slicing patent (Curtis).[7]

Moreover, the Court of Appeals simply ignored the District Court's findings as to the secondary factors, such as commercial success, filling a long-felt need, failure of others and copying. Instead, the Court of Appeals relegated the pronounced *synergism* of Petitioners' invention to the realm of "one factor considered in determining obviousness".[8]

It is respectfully submitted that synergism is entitled to substantial weight in determining non-obviousness under 35 U. S. C. 103, particularly when the secondary tests of commercial success, filling a long-felt need, failure of others and copying are present.

In this connection attention is called to the reasoning in *International Telephone and Telegraph Corporation v. Raychem Corporation*, 538 F. 2d 453 (1st Cir. 1976); Cert. denied 97 S. Ct. 238 (1976) wherein the First Circuit applied the rule of the *Sakraida* case in affirming a holding of patent validity and stated at 538 F. 2d 457:

> "Based on the district court's findings of fact, we hold that the invention claimed patentable under this standard. The Court found that the temperature rating of a wire insulation was 'unpredictably high' as compared with the temperature rating of its components. Also, as noted above, the wired insulation was unexpectedly flame resistant. Thus, the findings established a sufficient 'synergistic' effect between the materials in the new combination, to cross the legal border line from a combination which produces a 'more striking result' to one which constitutes a patentable invention. See Sakraida v. Ag Pro, Inc., supra. 96 S. Ct. 1532."

7. 16a.
8. 16a.

Similarly, in the case at bar the *tenfold* increase in production of a tomato slicer is easily a sufficient *synergistic* effect to cross the legal border line from a combination which produces a more striking result to one which constitutes a patentable invention.

This Petition for Certiorari should be granted so that the Court can fix the place of synergism as a guide in deciding non-obviousness under 35 U. S. C. 103, namely, as something more than one factor to be considered. Synergism is the essence of unobviousness. As defined by this Court in *Sakraida,* synergism is an effect greater than the sum of the several effects taken separately.

Where synergism is present there is necessarily a sufficient probability of "unobviousness" that the secondary factors of commercial success, filling a long-felt need, copying and failure of others should come into play in accordance with the rule of *Graham v. John Deere Co., supra,* and *United States v. Adams,* 383 U. S. 39 (1966).

In this connection, in the *Adams* case, the Court stated at 383 U. S. 52:

> "Nor are these the only factors bearing on the question of obviousness. We have seen that at the time Adams perfected his invention noted experts expressed disbelief in it. Several of the same experts subsequently recognized the significance of the Adams invention, some even patenting improvements on the same system."

This case should be reviewed on Certiorari to announce the rule that where there is a *synergistic* combination or *synergistic* result then there is a presumption of non-obviousness under 35 U. S. C. 103. This allows for the consideration of the presence or absence of the secondary considerations, such as commercial success, filling

a long-felt need, failure of others and copying within the rule of *Graham v. John Deere, supra.*

3. The Court of Appeals Improperly Determined That the District Court's Findings of Synergism Are Outweighed by the Conclusionary Partisan Testimony of Respondent's Expert That Had Been Rejected by the District Court.

The District Court found (74a):

> "The prior art is reflected in a variety of slicers and choppers, each designed to deal with the specific problems which are peculiar to a variety of individual foods and to perform different tasks in connection with the cutting or slicing of particular foodstuffs. While it is true that the individual components and elements are well known in the prior art, *there is a synergistic result obtained through particular relationships among them.*" (Emphasis added.)

The District Court further found (76a):

> "(2) while diverse elements of food slicers are well known in the art, it is the *synergistic result* of arranging these elements in a specific manner that is significant in the issuance of a patent for the invention;" (Emphasis added.)

The reversal by the Court of Appeals is bottomed solely on the testimony of Respondent's engineering witness, Mr. Karr. The majority of the Court of Appeals at three separate places (8a, 15a, 16a) characterizes Mr. Karr's testimony as uncontradicted and then specifically relies on such testimony (15a) in order to reverse the District Court.

This is contrary to what the District Court itself had found (77a):

> "We have heard the evidence of defendant's expert engineering witness. We understand his testimony to mean that slicers are interesting developments of known technology and that, while a particular slicer may be an extremely efficient, and well-designed piece of machinery, there is no invention in putting a slicer together. However, *in light of the prior art*, and of our determination of the ordinary level skill in the art, we disagree with his opinion as to the obviousness of the '582 patent." (Emphasis added.)

From the foregoing it can be seen that the District Court rejected the testimony of Respondent's expert not only because of its determination of the ordinary skill in the art, but also because of *the prior art*.

The Third Circuit then improperly held that if the District Court had applied the proper standard of skill that it would have had only the uncontradicted expert testimony of Mr. Karr to determine the question of "obviousness" with respect to such persons (15a).

In making the foregoing statement, the Court of Appeals completely ignored the other evidence as to unobviousness in the record. Such other evidence included the inadequacy of the prior art (which is readily understandable without expert assistance) as well as the secondary factors, such as commercial success, filling a long-felt need, failure of others and copying.

The most serious error of the Court of Appeals is in relying upon expert testimony that was expressly rejected by the District Court as set forth on this page. This is contrary to the Third Circuit's own rule that the trier of fact is not bound to accept expert opinion, even if it is uncontradicted. See *Minnesota Mining and Manufacturing Company v. Berwick Industries, Inc.*, 532 F. 2d 330, 333 (3rd Cir. 1976); *Huddell v. Levin*, 537 F. 2d 726, 735, 736 (3rd Cir. 1976). See also footnote 4 at 537 F. 2d 736. Moreover, see *Universal Athletic Sales Co. v. American Gym, Recreational and Athletic Equipment Corporation, Inc.*, 546 F. 2d 530, 542 (footnote 39) (3rd Cir. 1976).

The case at bar is an outstanding example of the principle that the need for expert testimony and the reliance on such testimony is usually the sole province of the trier of fact.

Where the invention is of the understandable mechanical type, such as the present invention, the District Court has every right to make its own analysis of the prior art based on guidance from and arguments of counsel.

For purposes of this Appeal Petitioners accept the thesis of the Court of Appeals that the correct standard of ordinary skill in the art is that of a skilled machine designer. However, the present invention with its *synergism* is so clearly novel that it would be non-obvious to any skilled machine designer or any one else.

If the Court of Appeals Opinion is permitted to stand, future trials in patent cases will involve an ever-increasing number of confrontations between paid, partisan experts delivering predictable testimony. Such "fruitless confrontation of experts"[9] in most instances will be of little help to the trier of fact, but will rather make trials of patent cases as well as discovery longer, more complicated and more expensive. This is certainly contrary to the public interest.

The deepest concern is that non-obviousness under 35 U. S. C. 103 in a patent case should be decided on the *objective* factors relating to the validity of a patent, such as *synergism* and the content of the prior art, as well as

9. *Nashua Corporation v. RCA Corporation*, 431 F. 2d 220, 224 (1st Cir. 1970).

the secondary factors, including the solution of a long-felt need, commercial success, failure of others and copying. The Court of Appeals Opinion in this case tells the District Courts that they can disregard all of the foregoing and even disregard "synergism" while relying solely on the testimony of a partisan expert.

VII.

CONCLUSION.

The granting of this Petition for Writ of Certiorari will enable the Court to set the proper place of synergism in evaluating "non-obviousness" within the meaning of 35 U. S. C. 103. In particular, the District Court's finding of synergism will be given the vitality it deserves so as not to be swept away by partisan expert testimony that was rejected by the District Court.

Moreover, this case presents a rare opportunity for the Court to review a meritorious invention which has been commercialized by individuals and a small corporation. As such, the present suit is free of the anti trust, patent misuse and patent fraud considerations that are so widely prevalent today.

Indeed, Petitioners' invention presents the ideal case of an individual making an invention when there simply was nothing available to perform the task at low cost. Petitioners' invention led to the building of a small business, while filling the needs of the public. This is a very important accomplishment which was in part encouraged by the prospect of a grant of a valid patent.

The District Court in thoughtful Opinions twice confirmed this. The Court of Appeals upset these opinions solely through the elevation of partisan expert testimony which had been rejected by the District Court.

The review of this case on Certiorari will afford this Court the opportunity to clarify the law regarding *synergism* as well as correcting the serious injustice of the Opinion of the Court of Appeals.

Respectfully submitted,

ALAN H. BERNSTEIN,
Attorney for Petitioners.

Dated: July 13, 1977.

Feb. 20, 1968 C. E. GIANGIULIO 3,369,582

TOMATO SLICER

Filed May 4, 1967

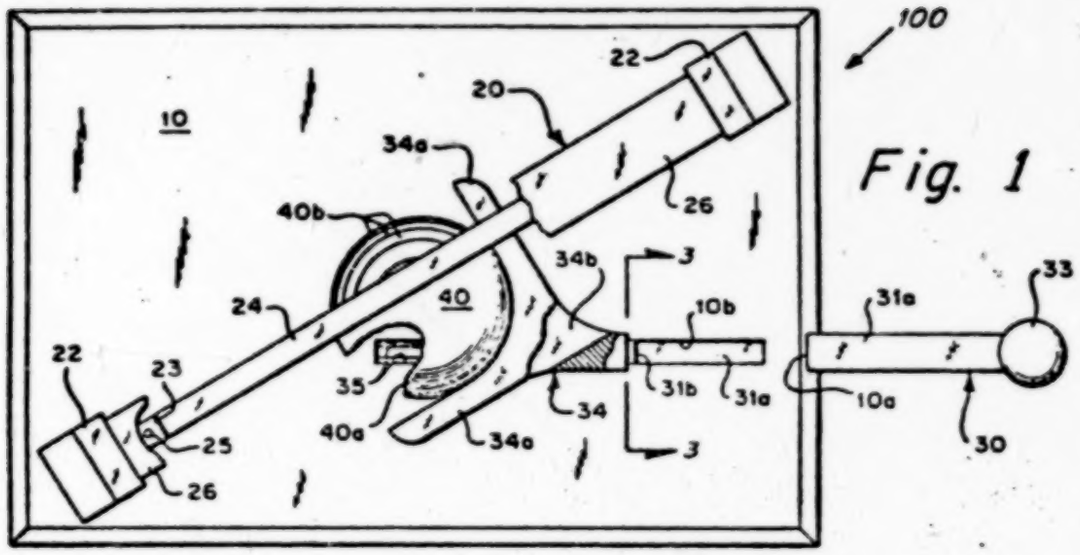


Fig. 1

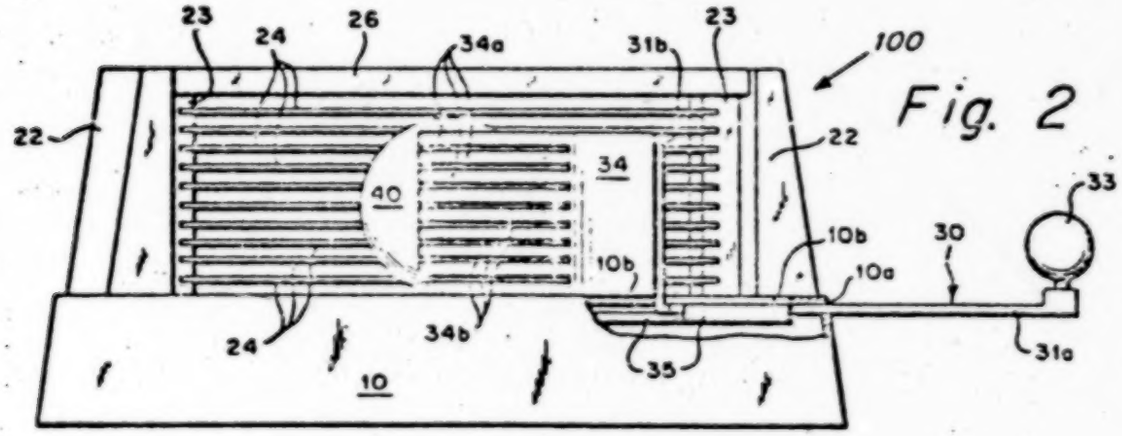


Fig. 2

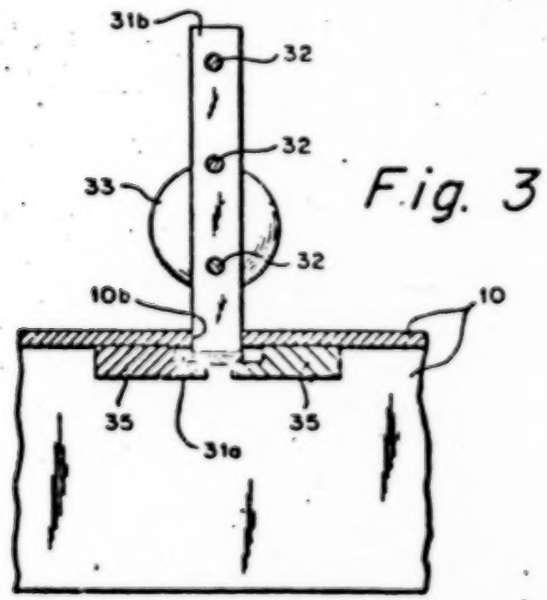


Fig. 3

INVENTOR.
CLAYTON E. GIANGIULIO
BY Paul Maleson
ATTORNEY

United States Patent Office 3,369,582 Patented Feb. 20, 1968

1

3,369,582
TOMATO SLICER
Clayton E. Giangiulio, Skyline Drive, R.D. 2, Malvern, Pa. 19355
Filed May 4, 1967, Ser. No. 636,176
9 Claims. (Cl. 146—169)

ABSTRACT OF THE DISCLOSURE

An apparatus adapted to slice soft fruit and vegetables and tomatoes in particular. A slidable pusher has a pocket to hold the fruit or vegetables and a number of slots to pass through the blades. A number of thin non-serrated blades are set at or near a preferred angle to the direction of motion of the pusher, and the pusher pocket has sides which intersect the blades within preferred angular limits.

Background of the invention

Slicing machines for many types of food products are of course very well known. Some of these are single bladed, usually using a revolving wheel, and others are multi-bladed. While many food products are easily cut with existing apparatus, the physical characteristics of tomatoes have made it difficult to simultaneously slice a tomato into slices for sandwich use. There is a tendency to crush and mangle the tomato. Much prior apparatus exists which in its rough and general appearance and structure is similar to that of the present invention.

Invention summary

It is an object of this invention to provide a fruit slicing apparatus.

It is another object of this invention to provide a multi-bladed apparatus for slicing soft fruit and vegetables, particularly tomatoes.

It is another object of this invention to provide a slicing apparatus having a pusher, with the pusher comprising a pocket to receive the object to be sliced, and the pocket having arms extending therefrom. The pusher coacts with an array of thin non-serrated blades. The blades are set at an angle to the direction of motion of the pusher of approximately thirty (30) degrees within certain limits. The leading arm of the pocket intersects the blade preferably at an angle slightly less than ninety (90) degrees. The trailing arm of the pocket intersects the blade preferably at a small angle.

The particular shape, structure and arrangement of the pusher and the blade array provide a means whereby the previously experienced problems in simultaneously slicing a tomato into many slices have been obviated. Previous problems include crushing or mangling of the fruit and may also have included the problem of having the fruit slide on the blade rather than be cleanly cut by it. The exact way in which each of the preferable relationships affects the desired clean and non-bruising slicing of a tomato is described in more detail below in connection with the detailed structure and operation of the apparatus.

Brief description of the drawing

FIGURE 1 is a plan view, partially fragmented, of the soft fruit slicing apparatus;

FIGURE 2 is a side view, partially fragmented of the apparatus; and

FIGURE 3 is a cross-sectional view taken along line 3—3 of FIGURE 1.

2

Description of the preferred embodiment

The invention is best understood in connection with the accompanying figures in which like reference numerals refer to like parts. The soft fruit slicing apparatus is generally designated 100. A generally rectangular base 10 is provided. The base 10 has a generally planar upper surface, generally solid except as described below. It is generally hollow. As shown, the base 10 has a general appearance of an inverted rectangular pan.

The base supports on its upper surface an array of blades. The structure of the blade array or assembly is best initially considered in connection with FIGURE 2. A pair of pedestals or vertical supports 22 are provided extending upwardly from the base. They are affixed to the base by spot welds. The two pedestals are positioned on the upper surface of the base substantially near two diagonally opposed corners. The two pedestals 22 are connected at their upper ends by means of a bridge 26. Bridge 26 serves the function of a blade, and also has the function of bracing apart the two pedestals against the tension stress due to the blades, as is described below. A further subsidiary function of bridge 26 is as a convenient and safe hand rest for the operator during the operation of the apparatus. The pedestals 22 and the bridge 26 are preferably and conveniently made of heavy gauge sheet metal bent so as to form channel members.

Each pedestal 22 has affixed to it a blade retainer 23. The blade retainer 23 is a vertically oriented block of metal, generally of rectangular cross section. These retainers 23 are positioned on their respective pedestals 22 so that they oppose and face each other. Each blade retainer 23 is provided with a plurality of spaced apart horizontal parallel slots, as best shown at the left side of FIGURE 2. These slots extend into the body of the retainer from the side thereof facing the opposed retainer, and do not pass all the way through the body of the retainer. Each slot accommodates the end of a blade 24. Each blade 24 is retained in its slot in each of the opposed blade retainers 23 by means of a vertical pin 25 running through each of the blade retainers 23. A vertical hole to accommodate pin 25 is provided through the center of each of the blade retainers 23. Likewise, a hole is provided near each end of each blade 24. The holes in the retainers and blade ends are so positioned that when each blade 24 is inserted in place as shown, all the holes of one end of all the blades register with the vertical hole through the blade retainer 23 so that pin 25 passes therethrough. The position and structure of pin 25 is best shown at the left hand portion of FIGURE 1, where it is shown below the broken away fragmented portion of bridge 26. This showing at the lower left hand corner of FIGURE 1 of course indicates the position of the corresponding holes in the retainer 23 and the blades 24. An identical structure is provided at the other end, that is, at the upper right hand corner of FIGURE 1.

Each blade is approximately eleven (11) inches long from hole to hole, approximately one-quarter (¼) inch wide, and approximately ten one thousandths (.010") inch thick. Thus, each blade is thin and vertically somewhat flexible, although unyielding in a horizontal direction. The blades are shown proportionally thicker in FIGURE 2 for ease of showing. The relative thinness of the blades, on the dimensional order as described above is preferable. It provides less beam strength than

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a thicker blade would, but it has the advantage of displacing less volume of the tomato, or other fruit object which is passing it. It has been found that this low displacement is important in making the clean cut as desired of an object such as a tomato. The provision of a plurality of such disposed blades for simultaneous cutting is an important aspect of the invention, but the exact number or spacing is subject to reasonable variation. Thus, a preferred form has one quarter (¼) inch spacing between the blades and a total of fifteen (15) blades. Less blades are drawn in FIGURE 2 for ease of showing. Other suitable spacings between the blades include three sixteenths (3/16) inch, three eights (⅜) inch and one half (½) inch. The edge of the blades 24 initially contacted by the object to be cut are sharpened to knife edges, but are not serrated. Serrations have been found to mangle soft fruits or vegetables, particularly tomatoes, which is the specific field of interest of this invention.

The pedestals 22 are affixed to the upper surface of base 10 so that each of the blades 24 is in enough tension to prevent any noticeable or substantial sag in the middle. That is, enough tension is exerted so that to the naked eye, the blades all appear to be substantially horizontal and parallel. The cumulative tension, and the additional stresses when an object is being cut, are one of the requirements for the provision of bridge 26 as has been described above.

The other major element of the apparatus is the pusher assembly. It includes a handle and a pusher. A horizontal longitudinally extended handle generally designated 30 is provided. A grip or knob 33 is affixed to the outer end of this handle. The operator grasps the grip 33 for operation of the apparatus. The handle includes a horizontal portion 31*a* and an upwardly extending vertical portion 31*b*. The vertical portion 31*b* is provided at the inward end of the handle 30, that is, at the end remote from the grip 33.

The handle is horizontally slidably movable with respect to the base and parallel to the long edge of the base. An aperture 10*c* is provided in base 10 in a side thereof closely adjacent the upper surface. This aperture 10*c* accommodates the horizontal portion 31*a* of handle 30. The means for providing the sliding motion is best shown in FIGURE 3. Handle guides 35 are provided affixed to base 10 to the bottom of the upper surface thereof, as shown. These guides 35 serve the function of providing an extended passage and a supporting rail below the horizontal portion 31*a* of the handle. The guides 35 may actually be a unitary member with a central slot extending in a longitudinal direction.

It is also necessary to permit the sliding motion that an aperture 10*b* be provided to permit the movement of the vertical portion 31*a*. This aperture 10*a* is provided in the upper surface of base 10.

The pusher or guide is generally designated 34. Viewed from above is a generally Y-shaped structure, and this horizontal plane shape is carried throughout the vertical extent of the pusher 34. It is affixed to the vertical portion 31*b* of handle 30 by means of studs or bolts 32 which attach vertical portion 31*b* to the base of what may be termed the stem portion of the pusher 34. The pusher also includes arms 34*a*. These are best shown in FIGURE 1 and they branch out from the stem portion.

As best shown in FIGURE 2, both arm portions 34*a* and part of the stem portion are provided with a plurality of spaced horizontal pusher slots 34*b*. As shown in FIGURE 2, the height of the pusher 34 is equal to the vertical height of the array of blades 24, and one of the pusher slots 34*b* is provided to register with each of the blades 24. The pusher is preferably made of a strong hard plastic. It has been found that a polycarbonate resin, a thermoplastic material, is satisfactory. A suitable such resin is that sold under the trademark Lexan of the General Electric Co. In FIGURE 1, part of the top of the pusher 34 is fragmented away at the stem portion to show the

extent to which the pusher slots 34*b* extend into the stem portion.

It is apparent that the pusher assembly may be moved by pushing the slidable handle 30 until the pusher 34 has passed through and into the blades 24 to the point where the blades meet the limit of the pusher slots 34*b*. It is also apparent that the pusher assembly may be withdrawn to the right, as shown in FIGURES 1 and 2, so that a tomato 40, considered as the typical and preferred object to be sliced, may be placed within the ambit of the pusher arms 34*a*. As best shown in FIGURE 1, the pusher arms join in a smoothly rounded fillet, and the curvilinear portion of the arms and their joint is termed the pocket of the pusher. The tomato 40 is placed on the upper surface of the base 10 in the pocket of the pusher 34. As shown in FIGURE 1, the pusher assembly has been partly moved from right to left so that there is a sliced portion 40*b* and an unsliced portion 40*a* of the tomato. The pusher assembly can be retracted to the right so that the entire tomato 40 may be placed within the pocket of the pusher arm 34 without interfering with the blades.

It is highly preferable to observe several geographical relationships between certain of the parts in order to achieve consistent usefulness in slicing tomatoes. There must be a certain amount of movement of the tomato in the direction of the blade rather than a direct pushing into the blade, to provide a slicing type of cutting action. A direct perpendicular contact of the tomato and the blade edge tends to bruise or mangle the tomato and in general be unsatisfactory. The preferred angle between the direction of travel of the pusher assembly and the length of the blades is thirty (30) degrees. A number of different angles have been tried, and it has been found that the preferable range is within ten (10) degrees on either side of this preferred angle. If the angle is greater than that, there is an insufficient slicing effect and the tomato tends to be damaged. If the angle is less, the slicing effect is satisfactory, but the length of the blades would necessarily have to be increased, and the limiting factor in this direction is the loss of beam strength and the loss of stability of alignment of the blades since they would have a long carry with no re-enforcement. Thus, the limitation against a smaller angle is one of engineering and the limitation against the larger angle is one of function.

The arm 34*a* shown partly through the blade array in FIGURE 1 is the arm of the pusher 34 that enters the blade array first and is referred to as the leading arm. The other arm is called the trailing arm. The angle between the straight portion of the leading arm and the cutting edge of the blades 24 is highly preferable to be slightly less than ninety (90) degrees. A preferred angle has been found to be approximately eighty-seven (87) degrees, and while an absolutely exact limitation cannot critically be established, it can be said that this angle should be more than approximately eighty (80) degrees and less than ninety (90) degrees. The reason is that if this angle is ninety (90) degrees or more, there is tendency to push the tomato along the blades too much rather than to force them into the blades. Such a situation tends to squash, bruise, and otherwise damage the tomato against the blades rather than encouraging the blades to take a smooth entering bite.

It is also highly preferable that a straight portion of the trailing arm of the pusher 34, seen horizontally, be not exactly parallel to the length of the blade 24. The trailing arm makes a small acute angle with the blades, with the apex of the measured angle being toward the pocket end of the arm. This angle insures that the tomato is fully pushed through the blades to the other side. Another and important reason for this angle is to prevent the tomato from tending to roll or be forced backward in a direction along the length of the blades, as the end of the push approaches. That is, it prevents the tomato from tending to slide in a reverse direction from its direction

during the major portion of the cut. Such an effect, if not avoided, also tends to mangle the tomato.

It might be thought that the simultaneous multiple slicing of a tomato would not present problems which would require such specific developments, but the tomato presents a frustrating combination of softness and tough skin which does produce the problems which the present invention solves.

Most of the parts of the apparatus 100 are preferably made of heavy gauge bent sheet metal, although other materials and methods of forming may be used. The grip 33 and the pusher 34 are preferably of plastic, although other materials may be used. The base 10 may have distinct legs rather than sides coming down all around to form an apron effect. Rubber feet or suction cups may be provided at the bottom of the base. It has been found desirable to provide interior bracing within the base 10, and an X-frame running from corner to corner close to the upper surface has been found a desirable bracing feature.

The geometrical relationships as described have been obtained in the preferred embodiment by making the angle of separation between the straight portions of the leading and trailing arms 34*a* greater than ninety (90) degrees, approximately one hundred ten (110) degrees, and by slightly skewing the mounting of the pusher 34 on the vertical portion 31*b* of the handle. The base of the stem portion of the pusher 34 is not cut perpendicular to the sides of the stem portion, but at an approximate five (5) degree bias, tending to rotate the pusher that amount in the direction of the leading arm.

The scope of this invention is to be determined by the appended claims and not limited to the foregoing description and drawing which are illustrative.

I claim:

1. A tomato slicer comprising a base, an array of blades extending vertically above said base and including a plurality of thin blades with sharp cutting edges in spaced relationship, a pusher assembly mounted on said base, and means to move said pusher assembly and said blades relative to each other in a path of movement, said pusher assembly including a pusher having a leading arm and a trailing arm, said pusher arms forming a tomato holding pocket and having a plurality of slots therein, each slot for reception of a blade of said blade array when said pusher and said blade array are moved relative to each other, said blade array being disposed with respect to said path of movement such that said blade array lies at an angle less than forty (40) degrees with respect to said pusher path of movement, the angle of separation between said pusher leading arm and trailing arm being greater than 90°, the angle between said leading arm and the cutting edge of said blades being less than 90° with the trailing arm of said pusher making a small acute angle with respect to said cutting edge, said last two angles both opening toward the pocket of said pusher, whereby said pusher assembly achieves a smooth shearing action with a tomato urged against and through said blades to secure a plurality of thin tomato slices, essentially undamaged, with said tomato holding pocket slots allowing said blades to pass through the tomato.

2. The invention of claim 1 wherein said pusher assembly is movable and said array of blades is fixed, with said pusher assembly being moved toward and into said blade array in a generally rectilinear path of movement, said blade array lying at an angle ranging approximately between 20° and 40° with respect to said pusher path of movement, the angle between said leading arm and the cutting edge of said blades being less than 90° and at least approximately 80°.

3. The invention of claim 2 wherein the angle of separation between said pusher leading arm and trailing arm is 110°.

4. The invention of claim 3 wherein the angle between said leading arm and said cutting edge is 87°.

5. The invention of claim 4 wherein the angle between said blade array and said path of movement is 30°.

6. A soft fruit and vegetable slicer comprising

(a) a base,

(b) an array of blades on said base, said array being stationary and including a plurality of substantially horizontal parallel elongated flexible thin blades with non-serrated edges in spaced relationship one above the other,

(c) a pusher assembly mounted on said base, means to provide horizontal rectilinear sliding motion of said pusher assembly with respect to said blade array,

(d) a pusher included in said pusher assembly, said pusher comprising a leading arm, a trailing arm, and a stem portion, said arms and said stem portion being joined together to form a curvilinear pocket, said pusher having a plurality of slots therein, one such slot being provided for each blade in said blade array and in vertical registration with each said corresponding blade,

(e) the direction of the elongation of all said elongated blades in said blade array and the direction of said rectilinear sliding motion being an acute angle in a horizontal plane,

(f) the direction of elongation of said elongated blades with respect to the direction of said rectilinear sliding motion being less than approximately 40°,

(g) the limit of said rectilinear sliding motion being such that said pusher assembly has a withdrawn position in which said leading arm is at least partly withdrawn from said blade array, and a forward position in which said arm has substantially passed said blade array and said trailing arm has at least closely approached said blade array, the angle between sid leading arm and the direction of said elongated blades in said blade array being less than 90°, and said trailing arm making a small acute angle with the direction of said elongated blades, said angle between said leading arm and the direction of said blades, as well as said small acute angle both opening toward the pocket of said pusher.

7. A soft fruit and vegetable slicer as set forth in claim 6 wherein the angle between the direction of said rectilinear sliding motion and the direction of the elongation of said elongated blades is between approximately 20° and 40°.

8. A tomato slicer comprising a base, an array of blades extending vertically above said base and including a plurality of thin blades with sharp cutting edges in spaced relationship, a pusher assembly mounted on said base, and means to move said pusher assembly and said blades relative to each other in a path of movement, said pusher assembly including a pusher having a leading arm and a trailing arm, said pusher arms forming a tomato holding pocket and having a plurality of slots therein, each slot for reception of a blade of said blade array when said pusher and said blade array are moved relative to each other, said blade array being disposed with respect to said path of movement such that said blade array lies at an angle less than 40° with respect to said pusher path of movement, the angle of separation between said pusher leading arm and trailing arm being greater than 90°, the angle between said leading arm and the cutting edge of said blades being less than 90° with the trailing arm of said pusher making a small acute angle with respect to said cutting edge, said last two-named angles both opening toward the pocket of said pusher, whereby said pusher assembly achieves a smooth shearing action with a tomato urged against and through said blades to secure a plurality of thin tomato slices, essentially undamaged, with said tomato holding pocket slots allowing said blades to pass through the tomato.

9. The invention of claim 8 wherein the angle between said blade array and said path of movement is 30°, the

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angle of separation between said gripper leading arm and trailing arm is 110° and the angle between said leading arm and said cutting edge is 87°.

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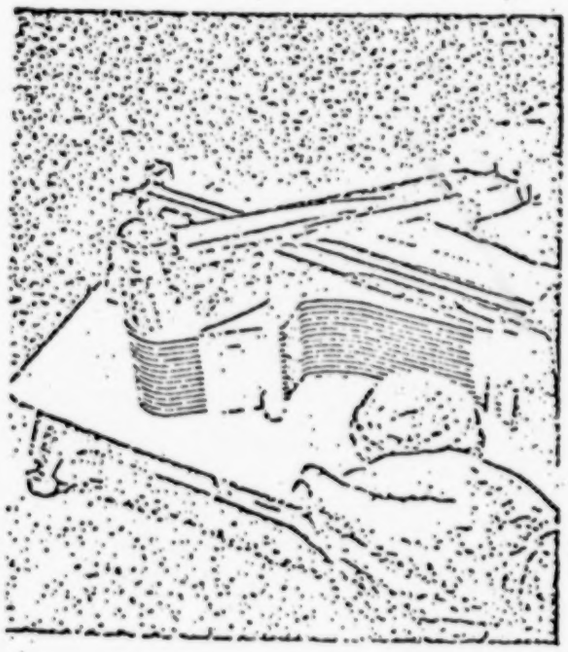
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W. GRAYDON ABERCROMBIE, *Primary Examiner.*

TOMATO KING SLICER MODEL TK-II

SLICES WHOLE TOMATOES PERFECTLY IN ONE SECOND!



New—Compact design fits easily on a shelf, stores readily
New—Tempered stainless steel cutting blades for extra strength and long life
New—Unique cutting action gives perfect slices every time
New—Only o. • moving part. No motors, bearing or bushing to wear out or replace

TOMATO KING SLICER—MODEL TK-II is designed for heavy duty commercial use. You can slice lug after lug of tomatoes with every one sliced clean, quick and uniform. It actually reduces your labor costs by 60-70% because it slices tomatoes five (5) times faster compared to conventional methods of slicing. You can additionally save 10-20% in food costs as your slices are always uniform and clean-cut with minimum waste.

Choose your thickness too. TOMATO KING slicer comes in 3/16", 1/4", or 3/8" sizes. You'll find it a time and money saver for slicing other soft food products such as pickles, peppers, lemons, boiled potatoes. No advance cutting necessary.

Kidde

WALTER KIDDE & COMPANY, INC., 675 MAIN STREET, BELLEVILLE, N.J. 07109

P167

Supreme Court, U. S.
FILED
JUL 13 1977
MICHAEL RODAK, JR., CLERK

IN THE

Supreme Court of the United States

October Term, 1977.

No. 77-75

SYSTEMATIC TOOL & MACHINE COMPANY, et al.,

Petitioners,

v.

WALTER KIDDE & COMPANY, INC.,

Respondent.

APPENDIX TO PETITION FOR WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE THIRD CIRCUIT.

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APPENDIX

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Court of Appeals Opinion, Filed March 25, 1977

UNITED STATES COURT OF APPEALS
FOR THE THIRD CIRCUIT

No. 76-1660

SYSTEMATIC TOOL & MACHINE COMPANY and SYSTEMATIC PRODUCTS, INC., and CLAYTON E. GIANGIULIO, and DOMINIC D'AMBRO,
Appellees

v.

WALTER KIDDE & COMPANY, INC.
Appellant

ON APPEAL FROM THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF PENNSYLVANIA

D.C. Civil No. 70-1708

Argued January 11, 1977

Before ROSENN and HUNTER, *Circuit Judges*, and SNYDER' *
District Judge

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* Daniel J. Snyder, Jr., United States District Judge for the Western District of Pennsylvania, sitting by designation.

(Filed March 25, 1977)

SNYDER, *District Judge:*

Systematic Tool and Machine Co., Systematic Products, Inc., and Dominic D'Ambro, licensees, with Clayton E. Giangiulio, owner of the patent, filed this action for patent infringement. The decision of the district court found valid and infringed Patent No. 3,369,582 (hereinafter "the '582 patent") issued February 20, 1968, for a hand-operated tomato-slicing device. Appeal was taken to this court under 28 U.S.C. § 1292(a)(4) giving us jurisdiction over "Judgments in civil actions for patent infringement which are final except for accounting." Since we find the subject matter of the patent and the prior art relating to this device is obvious, we reverse under 35 U.S.C. § 103.[1]

I. THE PATENT IN SUIT.

The patent in suit relates to a commercially successful[2] and efficient tomato slicer. As set forth in Claim 1, the device is characterized by the following features:

1. A pusher to hold the tomato and move it with reference to an array of blades.
2. The blade array lying at an angle less than 40° with respect to the pusher path of movement.
3. The angle of separation between the pusher leading arm and trailing arm being greater than 90°.

1. 35 U.S.C. § 103 reads as follows: "A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made."

2. See Appellees' Brief, p. 7. Capable of slicing a tomato per second, plaintiffs' invention, it was agreed, was an improvement over slicing with a hand-held knife or slicing with a meat-slicer which scattered individual slices, released juice, and required cleanup procedures. Commercial success without invention, however, will not make patentability. *Anderson's-Black Rock, Inc. v. Pavement Salvage Co., Inc.*, 396 U.S. 57, 61 (1969); *A & P Tea Co. v. Supermarket Corp.*, 340 U.S. 147 (1950); *U.S. Expansion Bolt Company v. Jordan Industries, Inc.*, 488 F.2d 566 (3rd Cir. 1973).

4. The angle between the leading arm and the cutting edge of the blades being less than 90°.
5. The trailing arm of the pusher making a small acute angle with reference to the cutting edge of the blades.

The plaintiffs assert that the tough skin and mushy interior of a tomato present a unique problem in slicing since a direct perpendicular contact of the tomato and blade edge tends to bruise or mangle the tomato. Plaintiffs' claimed invention solved this problem by the various angles between the leading and trailing arms which hold the tomato between the pusher and the angle of the cutting edges of the blades to the pusher. The '582 patent device pushes the tomato in a straight line through the rack of thin blades at an angle less than 40° with respect to the pusher path of movement. See Figure I.

The original claims filed did not relate the angle of the leading and trailing arms to the physical structure or recite any particular angles for them. The Examiner originally rejected the claims for two reasons: (1) for indefiniteness in not stating relationships between the angles and physical structures, and (2) for obviousness over a combination of prior art slicers with similar structures but having somewhat different angles relating to the blades and pusher. The claims were amended to distinguish the prior art (as underlined by the patentee to make it apparent how the claim differed from the prior art) as follows:

> ". . . . an [~~relatively small acute~~] angle less than forty (40) degrees with respect to said pusher path of movement, the angle of separation between said pusher leading arm and trailing arm being greater than 90°, the angle between said leading arm and the cutting edge of said blades being less than 90° with the trail-

ing arm of said pusher making a small acute angle with respect to said cutting edge, ... whereby said pusher assembly [~~achieving~~] achieves a smooth shearing action [~~by said blades through~~] with a tomato urged against and through said blades to secure a plurality of thin tomato slices, essentially undamaged, with said tomato holding pocket slots allowing said blades to pass through the tomato." [Additions to the claim are underlined; deletions are in brackets.]

II. The Accused Devices

There are two accused devices known as the TK-I and the TK-II machines. The TK-I, not sold since 1968, is a virtual copy of the plaintiffs' machine and was stipulated to be an infringement of the patent in suit, if the court finds the patent in suit valid. The TK-II, not sold since 1972, is a somewhat different looking method of doing that which the plaintiffs' device (called the "Tomato Tamer") achieves.[3] See Figure II.

III. The Trial Court's Treatment

The district court filed a preliminary opinion and order holding the '582 patent valid and infringed but allowed 30 days to file exceptions. Exceptions were filed and by its second opinion, the district court denied the exceptions, affirming and readopting its earlier findings of fact and conclusions of law. A third order later denied injunctive relief in view of the defendant's cessation of infringing activities in 1972.[4]

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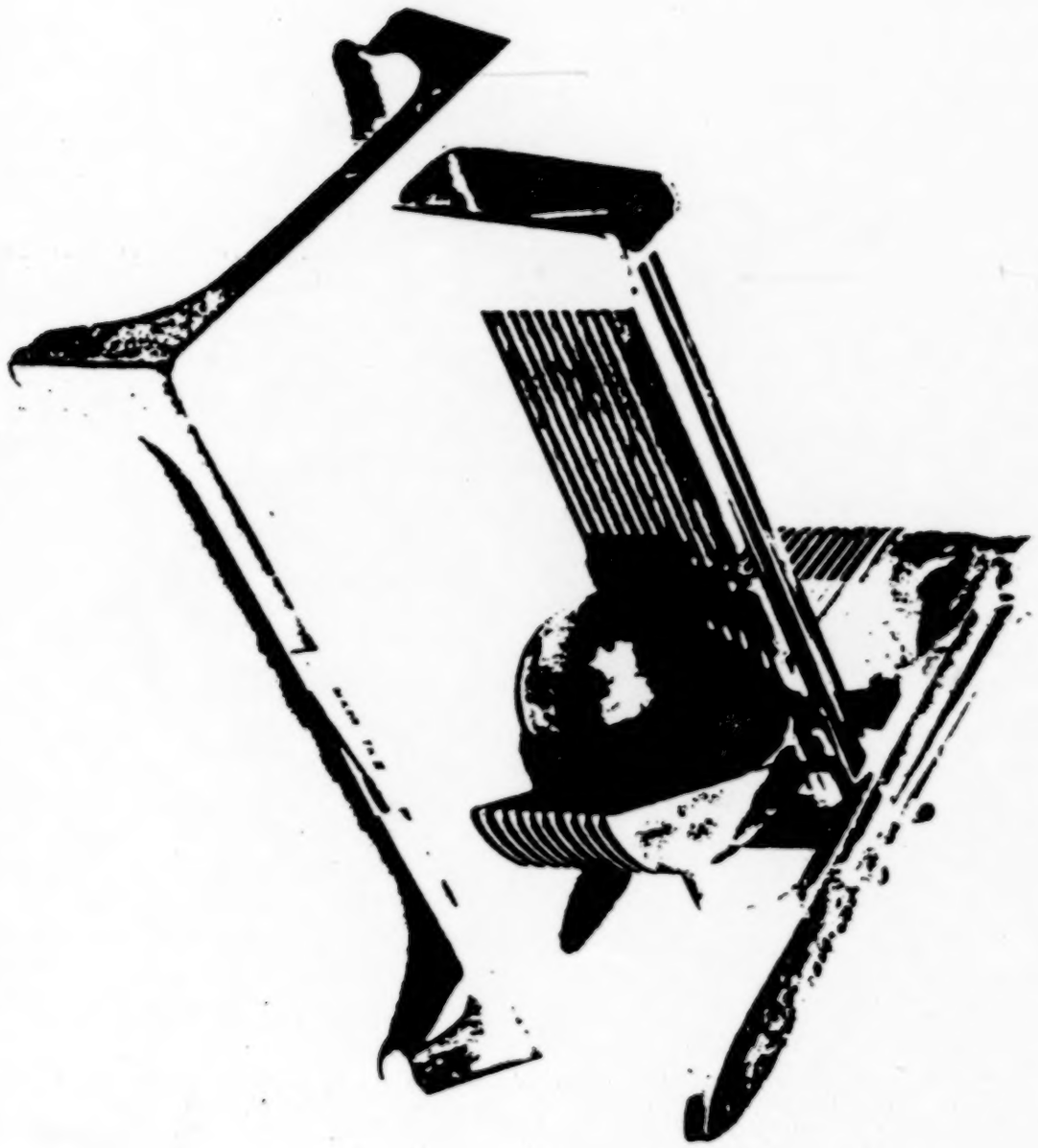
3. Redco, Inc. (a non-party) was the sole manufacturer of the accused devices and sold them to defendant Kidde which, in turn, resold through distributors as well as users like Burger King Corporation, an operator of hamburg restaurants. This action was commenced in the Northern District of Illinois against Kidde and several of its customers, including Burger King. It was transferred to the Eastern District of Pennsylvania, with Kidde as the only active defendant. Suit was stayed as to all other defendants pending disposition of the litigation before this court.

4. While apparently counsel originally conceived that accounting would proceed before appeal to this Court (Trial Transcript, p. 12) the three orders dispose of all proceedings in the district court except for an accounting and collectively constitute the requisite judgment for our jurisdiction under 28

FIGURE I



FIGURE II



Plaintiff's principal witness, Clayton Giangiulio, inventor and former delicatessen operator, pointed out that prior to his invention, tomatoes had been sliced with a hand-held knife, a slow process at best, or with an expensive commercial meat slicer which scattered individual slices, released juice, and required time consuming clean-up procedures. He demonstrated that a tomato could be sliced by pushing it with his hand but not as safely and efficiently as with the patented device. He admitted that while the basic elements of a slicer consisting of blades, pushers, bases and relative movement were well known, innovation was claimed in the unique arrangement of otherwise general elements which existed in different relationships in the prior art—"the slicing of tomatoes at a rate ten times greater than the prior art as well as providing straighter slices held together in the form of a tomato." (Appellees' Brief, p. 14.)

The defendant elicited through Ronald Karr, an extensively qualified mechanical engineer, a designer, and professor of mechanical design, that the '582 patent was a routine development of old elements in view of prior art patents for straight line slicing devices. He stated on cross examination:

> "Q. Now, you have testified with respect to six patents on direct examination?
>
> A. Yes, sir.
>
> Q. Is it your testimony that given these patents and put in a room you could come up with the invention in suit?
>
> A. I would need in that room several tools and materials to produce the invention. And I would have to qualify that a little bit, but yes; I could. And there are about half a dozen others that could do that. Since

4. (Cont'd.)
U.S.C. § 1292(a)(4). *Cf., Allis-Chalmers Corp. v. Philadelphia Electric Co.*, 521 F.2d 360 (3rd Cir. 1975); *W. L. Gore & Associates, Inc. v. Carlisle Corp.*, 529 F.2d 614 (3rd Cir. 1976); *Kramer v. Scientific Control Corp.*, 534 F.2d 1085 (3rd Cir. 1976).

I don't know every engineer in the country, there might be a thousand people that could do that." (p. 342a).[5]

The plaintiff chose not to contradict this testimony but to argue that the six prior art patents relied upon by the defendant did not show a pusher containing slots for the reception of blades, where the blade array lies at an angle of less than 40° with respect to the pusher path movement to achieve thin tomato slices in a single pass of the pusher through the blades.

The district court analyzed the six patents from a functional viewpoint saying for example, that the French patent to Birambeau for a tomato slicer relied on a sawing action which did not foreshadow a mechanical, single pass slicer such as the subject matter of the patent in suit. The court held that the Bever patent for a bun slicer could not pass completely through the tomato and "[n]o reasonable adaptation of the machine will perform such a function. Hence, we conclude that the Bever patent neither suggests nor discloses the subject matter of the patent in suit." The court continued this type of analysis through the other prior patents and concluded:

> "We have determined from the patent material submitted by the defendant and discussed above, that the ordinary level of skill in the art of food slicing is that possessed by an individual performing that task. . . .
>
> We have heard the evidence of defendant's expert engineering witness. We understand his testimony to mean that slicers are interesting developments of known technology and that, while a particular slicer may be an extremely efficient, and well-designed piece of machinery, there is no invention in putting a slicer together. However, in light of the prior art, and of our determination of the ordinary level of skill in the

5. Page numbers followed by "a" refer to pages in the Appendix to the Briefs.

> art, we disagree with his opinion as to the obviousness of the '582 patent. . . . We find that the subject matter of the '582 patent is not obvious to an individual possessing the average level of skill in the art, in light of the prior art existing at the time the invention was developed and the application was filed; the inventor of the '582 patent, Clayton Giangiulio, did not know of the existence of any device which suggested to him the machine he devised. Rather, the '582 patent was the product of his own independent and original development, and hence we disagree with the defendant's contention of obviousness from the prior art."

In coming to this conclusion the court rejected Karr's expert opinion that it is routine handbook procedure first to determine the physical nature of the object to be sliced, and that merely to recognize the physical properties of the common tomato[6] does not reach the level of invention. Further, the court held that the basic elements of fruit and vegetable slicers—blades, pushers, bases and means for relative movement—were well known in the prior art but that innovation existed here in the synergistic result achieved by the unique arrangement of these basic elements which existed separately or in different relationships in the prior art. The lower court concluded it was the plaintiffs' solution to the peculiar problem of slicing tomatoes (pressure build-up during slicing) that embodied innovative and unique developmental work which resulted in the invention.[7]

6. The following appears in Chapter *"1876 Centennial"*:

"Tomatoes have always been favorites here," wrote John Lewis, a transplanted Englishman. "They generally require a person to be educated to them. . . . They . . . are eaten in every possible way, mostly however cut up alone." From *We Americans*, A Volume in the Story of Man Library, published by The National Geographic Society, p. 228 (1975).

7. The lower court stated:

"Our conclusion is based on the following factors: (1) the central factor in the development of a food slicer is the identification of the unique problems associated with the preparation of a particular category of fruits or vegetables; (2) while diverse elements of food slicers are well-known

On infringement, the court relied on the doctrine of equivalents, *i.e.*, the essence of the invention used is identical even though the superficial form is different. *Cf., Graver Tank & Mfg. Co. v. Linde Air Products Co.*, 339 U.S. 605, 608 (1950) ("if two devices do the same work in substantially the same way, and accomplish substantially the same result, they are the same, even though they differ in name, form, or shape.") Since the TK-I admittedly infringed upon some of the claims of the '582 patent and the TK-II used the same element of the '582 patent (a shallow-entry-angle pusher in relation to the blades) for the same purpose and in the same manner, it, too, infringed.

IV. Obviousness

Very recently in *Sakraida v. AG Pro, Inc.*, 425 U.S. 273, 279-80 (1976) the court stated:

> "It has long been clear that the Constitution required that there be some 'invention' to be entitled to patent protection. *Dann v. Johnston*, — U.S. — (1976). As we explained in *Hotchkiss v. Greenwood*, 11 How. 248, 267 (1851): "[U]nless more ingenuity and skill . . . were required . . . than were possessed by an ordinary mechanic acquainted with the business, there was an absence of that degree of skill and ingenuity which constitute essential elements of every invention. In other words, the improvement is the work of the skillful mechanic, not that of the inventor.' This standard was enacted in 1952 by Congress in 35 U.S.C. § 103 'as a codification of judicial precedents

7. (Cont'd.)
in the art, it is the synergistic result of arranging these elements in a specific manner that is significant in the issuance of a patent for the invention; (3) it would be unusual for an engineer to have either the need for such a device, or the method of accomplishing the desired result; and (4) the activity of an engineer in those circumstances would be cumulative toward a successful embodiment of the concept, and not independent of the actual creative work involved in isolating the problems before arriving at a solution."

> . . . with Congressional directions that inquiries into the obviousness of the subject matter sought to be patented are a prerequisite to patentability.' *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). Section 103 provides:
>
> > 'A patent may not be obtained though the invention is not identically disclosed or described, as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.'
>
> The ultimate test of patent validity is one of law, *A & P Tea Co. v. Supermarket Corp.*, 340 U.S. 147, 155 (1950), but resolution of the obviousness issue necessarily entails several basic factual inquiries. *Graham v. John Deere Co., supra*, at 17.
>
> > 'Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved.' *Ibid.*"

These three inquiries—scope and content of the prior art, differences between prior art and the claims at issue, and the level of ordinary skill in the art—are findings of fact to be made by the district court; having resolved these crucial factual questions, the court then draws its legal conclusion as to obviousness. *E.g., Philips Elec. & P. Ind. Corp. v. Thermal & Elec. Inc.*, 450 F.2d 1164, 1173-74 (3d Cir. 1971). In the case before us, appellants claim that one of these factual questions—level of ordinary skill in

the art—was erroneously determined and that this resulted in an improper conclusion of law as to obviousness.

The search in this branch of inquiry under 35 U.S.C. § 103 is for a hypothetical person [8] having ordinary skill in the art to which said subject matter pertains, i.e., the problem solver and not the user of the solution. *Gass v. Montgomery Ward & Co.*, 387 F.2d 129, 132 (7th Cir. 1967), quoted in *Erie Technological Products, Inc. v. Die Craft Metal Products, Inc.*, 461 F.2d 5, 8 n.5 (7th Cir. 1972). ("The level of ordinary skill in the field appears to be that of mechanically inclined men with long experience in design of auto accessories"); *Howe v. General Motors Corporation*, 401 F.2d 73, 78 (7th Cir. 1968), *cert. denied* 394 U.S. 919 ("The level of ordinary skill in the field of designing automobile bodies, including hinges, was that of engineers of substantial training, and specialized skill.")

In the case at bar, the district court engaged in a detailed analysis of the prior art as illustrated in prior patents, admitting that the activity of an engineer, if he were aware of the problems associated with slicing tomatoes, would culminate in the patented concept. But it then stated:

> "(3) it would be unusual for an engineer to have either the need for such a device, or the method of accomplishing the desired result; and (4) the activity of an engineer in those circumstances would be cumulative toward a successful embodiment of the concept, and not independent of the actual creative work involved in isolating the problems before arriving at a solution."

8. In *Tokyo Shibaura Electric Co., Ltd., et al. v. Zenith Radio Corp.*, — F.2d — (3rd Cir. Jan. 7, 1977) at p. 12, *Fn.* 18, (Sl. Op.) we said:

"This theoretical person of ordinary skill in the art is 'charged with knowledge of all that the prior art disclosed at the time of his alleged invention, irrespective of whether persons of ordinary skill in the field, or he himself, or anyone else, actually possessed such all-encompassing familiarity with prior disclosures.' *Cool-Fin Electronics Corp. v. International Electronic Research Corp.*, 491 F.2d 660, 662 n.7 (9th Cir. 1974), *quoting Walker v. General Motors Corp.*, 362 F.2d 56, 60 n.3 (9th Cir. 1966). *Accord, Layne-New York Co. v. Allied Asphalt Co.*, 501 F.2d 405, 406 (3rd Cir. 1974), *cert. denied*, 421 U.S. 914 (1975)."

The court therefore looked to the knowledge of persons who perform the task of tomato slicing to determine skill in the pertinent art. By focusing on the user rather than the problem solver, the district court erred.

An interesting and pertinent application of principle can be gleaned from the court's treatment of the skill in the pertinent art for beehive fasteners in *In re Application of Grout*, 377 F.2d 1019, 1021 (3d Cir. 1967):

> "It is appellant's position that since the combination of elements claimed is to be used by beekeepers that it is to this group we must turn to ascertain what would have been obvious to them. After discussing the disclosures of the prior art, appellant states the position in his brief that:
>
> > The preceding discussion calls attention to a variety of facts, circumstances and reasons which *repel* the inference that it would have been obvious in 1961 for a man of ordinary skill in the beekeeping art to turn to the window shade roller art of Andersen's polymer film stretching device for ways and means of improving beehive components. Such facts, circumstances and reasons show the difference in problems and objectives in the several arts differ from one another and how the deformative measures inhering in the arts of the secondary references would be completely unsuitable for application to bees' wax foundation webs which are commonly used in the invention. . . .
>
> "Considering all the papers of record, we are not convinced that the 'person having ordinary skill in the art to which said subject matter pertains,' section 103, is exemplified by a beekeeper. Appellant's invention relates to novel fastening means used in beehives. It is alleged that a problem existed in the support of honeycomb foundations which appellant solved. While this *problem* would be encountered by a *beekeeper*, we

> think the problem naturally calls for the talents of one skilled in the art of *fasteners*. Under section 103 we must look to the person of ordinary skill in the art to which the invention pertains, not those who may use the invention." [Emphasis supplied.]

Similarly, in *Universal Athletic Sales Co. v. American Gym, Rec. & Ath. Eq. Corp.*, No. 76-1023 (3d Cir. Nov. 19, 1976), slip op. at 7, this Court looked to the problem solver in the business when it held that the art pertinent to a weight-lifting apparatus is the design of body-training devices. In other words, the hypothetical person skilled in the pertinent art is the mechanically skilled individual familiar with the design of devices in the industry. *Erie Technological Products, Inc. v. Die Craft Metal Products, Inc., supra; Howe v. General Motors Corp., supra.* Here, then the pertinent art is the design of food slicing devices. We hold, therefore, that the district court's finding as to the level of ordinary skill in the art was clearly erroneous.

Having resolved this critical factual issue, this court is in a position to draw the ultimate conclusion of law with respect to obviousness. As stated in *Deller's Walker on Patents*, § 109 at 153-154 (2d ed. 1964):

> "The issue of law as to whether an invention was obvious to one having ordinary skill in the art is one which a court of appeals is in as good a position to determine as the district court; the latter's conclusion on this issue, not being on a question of fact, is not clothed with a presumption of correctness, and instead requires that the court of appeals make its own independent determination thereon. Rule 52(a) does not require the court of appeals either to accept findings unsupported by the evidence or to require the court of appeals to respect conclusions which do not rest properly on the facts of the case. . . . [But] such finding[s] . . . of fact . . . unless clearly erroneous will

> not be set aside by the court of appeals." (Footnotes omitted)

Had the district court applied the proper standard of skill—that possessed by the mechanic familiar with the design of food slicing devices—it would have had only the uncontradicted expert testimony of Mr. Karr to determine the question of "obviousness" with respect to such persons.[9] Mr. Karr testified that it would be routine procedure for a mechanic first to determine the physical properties of the object to be sliced, see *supra* at 6, and that mechanics familiar with other patents in the food slicing industry would apply known mechanical principles to come up with the tomato slicer in question, see *supra* at 4-5. He supported his conclusion with testimony about six prior patents which would suggest to the mechanic the principles applied in the Tomato Tamer. Specifically, the Bever patent (a bun slicer) had its blade fixed at the same shallow angle to the path of the pusher, but it would not pass the blade clearly through the tomato. The Curtis patent (a fruit slicer) also showed an angls of less than 90° ("an angle of at least 70°") and contained the equivalent of the pusher leading arm of the Tomato Tamer (p. 329a).

Mr. Karr was asked by the Court:

> "You are saying in effect . . . that given a mechanic and designer of ordinary skill and given the problem of cutting a tomato, that the prior art which certainly

9. The dissenting opinion expresses concern that Mr. Karr did not represent a person having ordinary skill in the pertinent art—the design of food slicing machines. That concern would be relevant to the issue before us only if Mr. Karr had testified that the device in question would *not* have been obvious to anyone "who had the skills of an ordinary mechanic or designer." Then we would have been forced to remand the case so that the lower court could consider whether a person with the *additional skills* of one who designs food slicers might have viewed the device as obvious.

As it is, however, Mr. Karr testified that the device would have been obvious to *anyone* with ordinary mechanical or design skills—skills we must presume food slicing designers to possess. *A fortiori*, the device must have been obvious to the latter group, too. There is no need, then, to remand the case so that the impact of food slicing designers' *peculiar* skills can be considered.

> has encompassed pushers with pockets to hold the fruit or the object, blades to push them through and means of so angling the pusher so that it goes through the blades, that this would be an obvious thing for anybody presented with the problem who had the skills of an ordinary mechanic or designer?"

His response was, "Yes, your Honor." (p. 337a)

In light of this uncontradicted testimony about the skill of mechanics familiar with the design of food slicers, we need not remand to the district court for further findings of fact. Although the synergistic combination of known elements is one factor to consider in determining obviousness, we cannot agree that the district court's findings reveal any more of a synergistic effect than was found in the device to release water on a barn floor from a storage tank in *Sakraida, supra.* See also *Anderson's-Black Rock v. Pavement Salvage Co.*, 396 U.S. 57, 61 (1960). As a matter of law, plaintiff's slicer was "obvious."

Despite the commercial success of the product, there was no "invention" to warrant patentability, and the judgment of the district court will be reversed.

ROSENN, *Circuit Judge*, Dissenting.

What splits this panel is not the pertinent art of designing food slicers but the cutting edge of the appropriate principle to be applied in correcting a critical error in the district court's analysis. The majority believes that remand to the district court for further findings is superfluous and that this court can draw "the ultimate conclusion of law with respect to obviousness." I, on the other hand, believe that important and essential findings of fact are yet to be made and the case must be remanded to the district court before we can draw any conclusion as to whether or not the patent is obvious.

The question that confronts us is whether the ingenuity displayed in plaintiff's tomato slicing device rises to the level of patentable invention. The major controversy in this case is whether plaintiff's unique combination of elements known in the prior art was obvious under 35 U.S.C. § 103 (1970). As we recently stated in *Tokyo Shibaura Electric Co., Ltd. v. Zenith Radio Corp.*, No. 76-1237, slip op. at 10 (3d Cir. Jan. 7, 1977), "[t]he ultimate determination of patent validity is a conclusion of law reviewable for error, but the resolution of the obviousness issue depends on several basic factual inquiries reviewable under the 'clearly erroneous' standard of Fed. R. Civ. P. 52(a)."

The three crucial factual inquiries underlying the determination of obviousness are the scope and content of the prior art, the differences between the prior art and the claims at issue, and the level of ordinary skill in the pertinent art. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966); *Philips Electronic & Pharmaceutical Industries, Inc. v. Thermal Electronics Industries, Inc.*, 450 F.2d 1164, 1173-74 (3d Cir. 1971).

The majority has accurately pinpointed the problem with the district court's decision as its resolution of "the level of ordinary skill in the pertinent art." In finding that this level of skill was that possessed by a hypothetical person skilled in the slicing of food, the district court took an impermissible shortcut and ended up in the wrong tomato patch.

The district court evidently failed to realize that a determination of the level of ordinary skill in the pertinent art is necessarily a two-step process: first, the pertinent art must be identified; secondly, the level of ordinary skill in that art must be ascertained. An attempt to resolve the issue without breaking it down into its two component steps can only lead to confusion.

I agree with the majority that the district court erred in identifying the pertinent art as food slicing. As the

majority holds, the decisions of our sister circuits and our own recent decision in *Universal Athletic Sales Co. v. American Gym, Recreation & Athletic Equip. Corp.*, 546 F.2d 530 (3d Cir. 1976), would indicate that the pertinent art here is not the slicing of food but rather the *design of food slicing devices.* Having identified the pertinent art, however, we must still ascertain the level of ordinary skill in that art. It is at this point that my views diverge from those of the majority.

The majority simply assumes that the level of ordinary skill in the art of designing food-slicing devices is that of an ordinary mechanic. The majority then proceeds to place great weight on Mr. Karr's testimony that the patented device "would be an obvious thing for anybody presented with the problem who had the skills of an ordinary mechanic or designer." (Majority op. at 16.) My difficulty with Mr. Karr's testimony is twofold: first, although he may be an accomplished engineer of sorts, Mr. Karr's expertise seems to lie primarily in the design of aircraft propulsion systems and industrial machinery. Referring specifically to his experience in the designing of food-cutting devices, Mr. Karr testified:

> Q: Did you ever have anything to do with designing any machines that could be compatible with use in the food industry?
>
> A: I never had occasion to design a food or bread cutting machine. No, Your Honor.

His only experience with slicers was in 1961 and these were film splicers, not food slicers. In short, little weight can be attached to the testimony of Karr, a mechanical engineer, who had no familiarity with the pertinent art as we have identified it.[1] Secondly, Karr's testimony assumed a fact yet to be proved—that the level of ordinary

1. The majority makes no attempt to justify its reliance on Karr's testimony; it simply ignores Karr's near total ignorance of the pertinent art.

skill in the art of designing food slicing devices is the skill possessed by an ordinary mechanic. I can find no evidence in the record to support that assumption, which the majority treats as an established fact. Neither Karr nor anyone else testified to the level of ordinary skill in the pertinent art.

In telescoping what should be a two-step inquiry—the identification of the pertinent art and the determination of the level of ordinary skill in that art—the majority suggests that ascertaining the former automatically fixes the latter. Applying this novel theory to the instant case, the majority holds that "we must *presume* food slicing designers to possess [the skill of an ordinary mechanic]." Majority Opinion at 15 n.9 (emphasis supplied). That the majority cites no authority for making such a presumption as to the level of ordinary skill is not surprising since *John Deere, supra,* requires that the level of skill be ascertained by a factual inquiry, not somehow "presumed" out of thin air.

The majority also fails to recognize that the level of ordinary skill is defined by those who practice the art, not by the art itself. *See, e.g., CBS v. Sylvania Electric Products, Inc.*, 415 F.2d 719 (1st Cir. 1969), *cert. denied,* 396 U.S. 1061 (1970). It certainly does not appear self-evident to me that because the pertinent art in the instant case is the design of food-slicing equipment the level of ordinary skill must be that of an ordinary mechanic. The two questions are quite distinct. The level of skill in the pertinent art is a pure question of fact, *Philips Electronic, supra,* not the result of a legal equation.

The level of ordinary skill in the art of designing food-slicing devices can be resolved only by evidence as to the skills of those who practiced that art at the time of making the invention. *Shankin Corp. v. Springfield Photo Mount Co.*, 521 F.2d 609 (1st Cir. 1975); *Application of Trubojevich*, 361 F.2d 1013, 1014 (CCPA 1966). The level of ordinary skill may have been high or low, either capable

or incapable of producing the patented device. A host of questions may have to be answered, such as: At the time of this claimed invention, who were the people actively engaged in the field? What was their educational background? How much and what sort of experience had they had in the field? How often had they met with success in tackling similar problems? *See, e.g., Jacobson Bros., Inc. v. United States,* 512 F.2d 1065 (Ct. Cl. 1975); *CBS v. Sylvania Electric, supra.* It is even appropriate to assess the approaches to the sort of problem here involved taken by other practitioners of the art; evidence of the scope and depth of their approaches might be highly probative of the level of skill which they possessed. *See, e.g., Shankin Corp. v. Springfield Photo Mount Co., supra.* The level of ordinary skill can be ascertained only by answering questions such as these; no shortcut is defensible. Such an analysis depends on evidence; it requires findings of fact which only the district court can make.

Since the district court failed to answer any such questions, either explicitly or implicitly, we have no choice but to remand. Even if it were permissible for us to determine the level of ordinary skill in the pertinent art, we would be unable to do so on the basis of the present record; the record is completely silent in this area. The testimony of Karr, on which the majority relies exclusively, is entitled to little weight since Karr, a mechanical engineer, did not provide—and could not provide—any evidence whatsoever as to the level of ordinary skill in the art of designing food-slicing equipment. He candidly conceded that he had no familiarity with the art. Karr's testimony would have value only if we could determine that the assumptions on which he relied were correct. The record before us, however, provides no basis upon which we can make such determination, one way or the other. The case therefore should be remanded to the district court so that it can properly fill the gaps in the record and make appropriate findings of fact.

Accordingly, I respectfully dissent.

A True Copy:

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Clerk of the United States Court of Appeals for the Third Circuit.

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22a

Filing of Petition for Rehearing, April 7, 1977

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April 7, 1977

United States Court of Appeals
For the Third Circuit
21400 United States Courthouse
Independence Mall West
601 Market Street
Philadelphia, Pennsylvania 19106

Attention: T. F. Quinn, Clerk

Re : Systematic Tool & Machine Co., et al
vs.
Walter Kidde & Co., Inc.

Sub : Appeal No. 76-1660

Dear Mr. Quinn:

I am hand delivering twenty-five copies of Appellees' Petition for Rehearing In Banc in connection with the above entitled Appeal.

Respectfully submitted,

CAESAR, RIVISE, BERNSTEIN & COHEN, LTD

By Alan H. Bernstein
Alan H. Bernstein

AHB:amp
encs.

cc + (2) encs.
Jacob C. Kellem, Esq.
Richard H. Rosenbleeth, Esq.
Gordon D. Coplein, Esq.

23a

Order on Petition for Rehearing, April 28, 1977

UNITED STATES COURT OF APPEALS
FOR THE THIRD CIRCUIT

No. 76-1660

SYSTEMATIC TOOL & MACHINE COMPANY and SYSTEMATIC PRODUCTS, INC., and CLAYTON E. GIANGIULIO, and DOMINIC D'AMBRO

v.

WALTER KIDDE & COMPANY, INC.,

Appellant

SUR PETITION FOR REHEARING

Present: Seitz, Chief Judge, VAN DUSEN, ALDISERT, ADAMS, GIBBONS, ROSENN, HUNTER, WEIS, GARTH, Circuit Judges, and SNYDER, District Judge*

The petition for rehearing filed by Systematic Tool & Machine Company, et al.,

Appellees,

in the about entitled case having been submitted to the judges who participated in the decision of this court and to all the other available circuit judges of the circuit in regular active service, and no judge who concurred in the decision having asked for rehearing, and a majority of the circuit

Order on Petition for Rehearing, April 28, 1977

judges of the circuit in regular active service not having voted for rehearing by the court in banc, the petition for rehearing is denied.

BY THE COURT,

_____
Judge

Dated: April 28, 1977

*Daniel J. Snyder, Jr., United States District Judge for the Western District of Pennsylvania, sitting by designation.

District Court Opinion, Filed February 21, 1975

IN THE UNITED STATES DISTRICT COURT

FOR THE EASTERN DISTRICT OF PENNSYLVANIA

IN RE: SYSTEMATIC TOOL & MACHINE CO. et al
vs
WALTER KIDDE & CO., INC.

DATE: 2/25/75

NO: C.A. 70-1708

This is to advise you that the Honorable Herbert A. Fogel filed an Opinion, Findings of Fact, Conclusions of Law & Order dated 2/21/75:

(See attached Order)

THE CLERK'S FEE IS $ 12.50
for said Opinion, Memorandum and/or Order

JOHN H. HARDING, ESQ.
CLERK

By Lena M. Easley
Deputy Clerk

Notice to:
Caesar, Rivise, Bernstein & Cohen
Blank, Rome, Klaus & Comisky
A. Silverman, Esq.
J. C. Kellem, Esq. (Wilmington, Del.)

IN THE UNITED STATES DISTRICT COURT
FOR THE EATERN DISTRICT OF PENNSYLVANIA

SYSTEMATIC TOOL & MACHINE COMPANY, et al	:	
Plaintiffs	:	
-vs-	:	CIVIL ACTION
WALTER KIDDE & COMPANY, INC.	:	NO. 70-1708
Defendant	:	

OPINION AND ORDER

FOGEL, J. FEBRUARY 21,1975

I. HISTORY OF THE CASE AND STATEMENT OF THE ISSUES

A. PROCEDURAL CHRONOLOGY OF THE ACTION

This is an action for infringement of United States Letters Patent 3,369,582 (the "'582 patent"). The patent was granted on February 20, 1968, to Clayton Giangiulio for a "Tomato Slicer", a hand-operated device which can made multiple slices of tomatoes for the food service

industry with rapidity and efficienty. Plaintiffs claim that two tomato slicers marketed by Walter Kidde & Company infringe upon their rights under the '582 patent. They seek an injunction and monetary damages.

Suit was originally instituted in the Northern District of Illinois against Kidde and several of its customers, but thereafter, on motion of Kidde, was transferred, as to it, to the Eastern District of Pennsylvania. Action against the customers, (who were charged with wrongdoing through their purchases of the challenged appliances), was stayed, pending resolution of the aspect of the case which is now before us.

Plaintiff, Systematic Products, Inc. (Systematic), the legal successor to Systematic Tool & Machine Company, is a Pennsylvania corporation; it is the

exclusive licensee of the '582 patent, and manufactures and sells a device embodying the patent under the name "Tomato Tamer". Plaintiff Clayton Giangiulio is the holder of the '582 patent, the inventor of the slicer, and is currently an employee of Systemtaic; plaintiff Dominic D'Ambro owns an interest in the patent pursuant to a contract entered into between him and the other plaintiffs.

Defendant Walter Kidde & Company, Inc. (Kidde) is a Delaware corporation which maintains a regular and established place of business in this district. Kidde in the past marketed two models of tomato slicers under the trade names "Tomato King I" and "Tomato King II" ("TK-I" and "TK-II"). It no longer sells these machines, nor indeed, any other apparatus designed for the same purpose. All of the challenged devices were manufactured for Kidde by Redco, a Delaware corporation,

which is not a party to this litigation.

The outcome of this phase of the controversy hinges exclusively upon a resolution of plaintiffs' claim of infringement by Kidde of the '582 patent prior to 1972 - the year in which it terminated the sale of the Redco-manufactured equipment.

B. BASIS FOR JURISDICTION

Jurisdiction is based upon 28 U.S.C. §1338 and 35 U.S.C. §281; those sections of the Code create a cause of action for patent infringement and vest jurisdiction to determine such controversies in the District Courts of the United States. Venue lies in the Eastern District of Pennsylvania under 28 U.S.C. §1400(b), because defendant has a place of business in this district and also has allegedly committed infringing acts within the territorial reach of this Court.

C. STATEMENT OF THE ISSUES

Two encompassing issues are presented by this controversy, and may be summarized as follows:

FIRST: The validity of the patent and, SECOND: infringement by defendant, if, in fact, the patent is valid.

1. Criteria for Validity

Ascertainment of validity, in turn, requires us to resolve the following subsidiary, albeit, critical matters, which are crucial links in the chain plaintiffs must forge if they are to previal: (1) anticipation of the patent in the prior art; (2) obviousness from the prior art; (3) the ordinary level of skill in the art.

Moreover, a determination of these subsidiary issues does not end the matter; plaintiffs must also satisfactority establish: (a) their ability

to meet the requisite standards of the so-called secondary tests of commercial success: (i) long-felt need, (ii) failure of others, and (iii) copying by others; (b) their ability to meet the standards necessary to overcome the factors of patent invalidation (including proof that they did not commercially use the device for a period in excess of one year from the date the patent application was filed); and (c) their ability to prove that the patent documents set forth the "best mode" for performance.

2. Tests of Infringement

Disposition of the second major issue, infringement, calls for solutions to the following problems: (1) the scope of claims of the patent in controversy; (2) the issue of literal infringement of those claims; (3) the applicability of the doctrine of "file wrapper estoppel";

(4) the relevancy of the "doctrine of equivalents"; and, finally, (5) plaintiffs' proof of willful and wanton infringement.

We begin with the threshold question of validity of the '582 patent. Only after a positive finding as to that matter, can appropriate inquiry be made into the claim of infringement.

As a result of our review of the entire record of this case, which consists of: (a) the testimony and exhibits adduced at the trial; (b) agreed-upon stipulations of fact; (c) certain answers to interrogatories; (d) agreed-upon portions of pre-trial depositions, together with other documents and data developed in the discovery phase of the litigation; (e) the final pre-trial Order of the parties; (f) the requests for findings of fact and conclusions of law; and finally, (g) the arguments and compre-

hensive briefs in support of their respective contentions; we make the following:

II. FINDINGS OF FACT

Procedural History of the Action

1. Plaintiff Systematic is a Pennsylvania corporation doing business within the Eastern District of Pennsylvania. Systematic is the exclusive licensee of the '582 patent, and manufactures and sells a device under the name "Tomato Tamer". Plaintiff D'Ambro owns an interest in the '582 patent.

2. Defendant Kidde is a Delaware corporation with a regular and established place of business within this district. By stipulation, Kidde has committed an act of alleged infringement in this district after the date of issuance of plaintiff's patent.

3. Defendant Kidde has sold, but

has never manufactured, the "TK-I" and the "TK-II" tomato slicers. Neither appliance is now sold by Kidde. Both modles of the device were manufactured by Redco, a Delaware corporation, which is not a party to this suit.

4. This action was originally begun in the Northern District of Illinois against Kidde and several of its customers. It was subsequently transferred to the Eastern District of Pennsylvania, with Kidde as the only remaining active defendant. Suit was stayed as to all other defendants, pending disposition of the litigation before this Court.

Background of the Patent in Suit

5. Prior to May 4, 1957, the date that application Serial No. 636,176 was filed, tomato slicing by those engaged in the business of food preparation and service was accomplished by such diverse methods as: (a) hand slicing,

(b) slicing by means of commercial electric meat slicers, or (c) slicing on large-scale multi-purpose food processing machines. None of these techniques was suitable for the entire spectrum of food service establishments which use sliced tomatoes in vastly differing quantities, the volume varying with the nature of the particular operation, and with changing demands within any given establishment itself, depending upon the nature of the particular business.

6. The hand-wielded knife can make only one cut at a time; the evenness of the slices depends upon the accuracy of the wielder; personal injury may result from the bare knife blade; the heel of the tomato may be too difficult to cut, thereby creating waste; use of a knife requires extensive physical handling of the fruit; increasing the danger of bacteria,

spoilage and general lack of sanitation; this method intensifies exposure to air on all sides, thus increasing the rate of deterioration of pre-sliced tomatoes. Finally, it is difficult to reassemble the individual slices for storage in a manner that will shield the individual slices for storage in a manner that will shield the raw edges from exposure to the atmosphere.

7. The commercial meat slicer is relatively expensive, usually costing over $500.00 per machine. Production is at the rate of one slice per pass; the individual slices scatter about the pan, and the decomposition problems presented parallel those arising from the use of a knife. The mass of the follower, an integral part of the machine, can squash part of the tomato with resultant waste. The cutting process releases quantities of juice, frequently

causing time-consuming clean-up procedures. Acids in the juice attack the slicer parts, particularly the blades, eventually resulting in damage to the equipment. Moreover, since the primary purpose of the slicer is to cut meat, its diversion for tomato-slicing frustrates the achievement of optimum efficienty in connection with overall food preparation.

8. Multi-purpose slicing machines will slice tomatoes; however, this equipment typically costs at least $2400.00 per unit.

9. Hand operated mechanical vegetable slicers, such as the "Vegematic", cannot slice tomatoes; they mangle them instead.

Development of the Patent in Suit

10. Clayton Giangiulio, while operating a delicatessen in 1965 and 1966, was struck by the absence of relatively inexpensive and simple equipment to slice

tomatoes. After rejecting all of the devices on the market because of various infirmities, he set about to invent such an implement. His criteria for the machine were: (a) moderate purchase price, (b) ability to slice tomatoes of different size and texture, (c) ease of cleaning, (d) speed of repetitive slicing, and (e) creation of a non-temperamental instrument.

11. Mr. Giangiulio's analysis of the problems which made other machines, such as the common "Vegematic" device, unsatisfactory for commercial tomato slicing, led him to focus on the nature of the fruit itself. Tomatoes possess the peculiar features of a very tough outer skin and a soft, virtually structureless interior. This contrasts sharply with foods such as onions or apples, which have considerable structural integrity, even when quite ripe. Unripe or barely ripe tomatoes may

possess such rigidity, but ripe and overripe tomatoes, in a word, are mushy. Such tomatoes create serious problems for preparers because the practice in the food-service industry is to purchase in bulk, typically enough for a week, in order to take advantage of the attendant savings. By the end of a week, a large quantity fo the supply becomes soft, and, therefore, would be wasted, if ordinary slicing methods had to be employed.

12. Typical existing slicing machines, at the time, forced the blades through the fruit; pressure buildup inside the tomato then either exploded it, or if the first cut were accomplished, the skin, more often than not, would be shredded. Further pressure on the damaged tomato would squash the fruit, although once the tomato was sliced about one-third through, direct pressure could be applied to complete the slicing action without additional damage.

The basic solution, Mr. Giangiulio concluded, was the creation of an appliance which could pierce the skin smoothly, before pressure had built up within the tomato.

13. Mr. Giangiulio, drawing upon his experience as a tool and die maker, worked for several months on the project and finally produced an operable prototype in March, 1966. The machine incorporated a racked set of thin, non-serrated blades, a supporting base, and a pusher mechanism. The fruit was introduced into the blades at a shallow angle. A shearing action generated by the movement at this shallow angle to the baldes would, and did pierce the skin of the softest tomato before the pressure reached a point that shattered the fruit; it was then pushed through the blades, until the slicing operation was complete. The pusher design which controlled the path along which the tomato was moved,

constrained the fruit within relatively narrow limits. The pusher was slotted to match the spacing of the multiple blades, with the result that several slices could be made simultaneously, and the tomato could consequently be passed completely through the blades. The instrument was hand-operated, could be fabricated in a machine shop at a relatively low cost, and was capable of repeatedly slicing whole tomatoes in any stage of ripeness, at a rate of approximately one tomato per second. Very little residue remained, and such leavings could be removed easily, with the result that the cleanup process was a simple one; the device was easy to operate; it did not expose the tomato's interior to atmospheric contamination; physical handling was limited to placing the fruit in the slot of the pusher and picking up the still-assembled sliced tomato; slices were uniform, and no waste

resulted, even when over-ripe tomatoes were cut in this manner.

14. Mr. Giangiulio was advised to make his preferred embodiment marketable after he sought advice with respect to patentability. He therefor made changes to improve the aesthetics, the ease of tooling, operation and cleaning, and the longevity of a production model. One of these machines, called the "Lexan machine", (because of the plastic composition of the pusher), was given to a patent attorney for the preparation of drawings and the filing of an application in May, 1966. The "Lexan machine" was never sold to the public because (1) the tooling and material costs for a plastic pusher were discovered to be far too high for the production contemplated at that time, and (2) the blades tended to catch in the pusher slots about ten per cent of the time, thereby jamming the machine during those periods of

operation. Substitution of an aluminum pusher solved both problems. In July, 1966, the first twenty-five production machines, which had aluminum pushers, were ready. That model, with some further non-functional aesthethic changes, is still the device that is currently marketed by Ssytematic under the name "Tomato Tamer".

15. Sales were immediate and satisfying; over 20,000 machines had been sold at an average price of $79.00 per unit when this action was tried. Ths is impressive volume, particularly in view of plaintiffs' modest promotion and advertising campaign, the general pattern of single purchase (blades can be replaced without need for a new unit), and the specialized use of the apparatus, which slices tomatoes only, and is not interchangeable with meat slicers, or other multi-purpose food-cutting equipment.

The Patent in Suit

16. The initial application for patent, Application Serial No. 636,176, was filed on May 4, 1967, and was expedited because of a suspected infringement. That application with subsequent amendments was initially rejected for two reasons: FIRST, indefiniteness, and SECOND, alleged obviousness, based upon two prior patents reviewed by the Examiner. A meeting was held with the examiner, as a result of which the claims were clarified by additional specifications for certain angular relationships. The rejection for obviousness was withdrawn, and, on February 20, 1968, the patent was granted on new claims which essentially repeated those originally put forth, as augmented by the information with respect to the angular relationships and the basis for their measurement.

17. The '582 patent discloses the method of solving the problem associated with high-speed mechanized slicing of tomatoes, and a specific embodiment of that solution. In essence, it reveals a base, a rack of blades and a pusher assembly mounted on the base, a means to move the base and the blades relative to each other, and certain angular relationships among the component parts.

18. The '582 patent further discloses that the path of movement is to be at an angle of less than 40°, and preferably 30°, to the cutting surface of the blades.

19. The '582 patent also describes a design of pusher assembly, consisting of a leading arm, a trailing arm, and a curvilinear fillet called the pocket; that portion of the device is a "Y" shaped array capable of supporting a tomato. The pusher is cut by slots which permit it to mesh with the blades so that the tomato is

sliced completely.

20. The '582 patent also reveals certain angular relationships among the blade edges and the leading arm, the trailing arm, and the path of movement, so that a tomato is confined laterally, and can be introduced into the blade array at a specified angle.

21. The effect of the angular relationships is described as achieving a smooth shearing action as the tomato is pushed against and through the blade array in a manner that uniformly makes thin tomato slices, essentially undamaged, while the tomato holding pocket slots allow the blades to pass through the tomato entirely, thus achieving the goal of rapid slicing of pieces of uniform size.

22. The preferred embodiment suggests certain materials for some parts, and involves rectilinear operation, in that

the pusher travels along a straight path.

VALIDITY

Anticipation

23. The following six patents were cited by defendant as establishing the scope and content of the prior art for the purpose of showing anticipation of the patent in suit:

French Patent	1,085,144	(Birambeau)
United States Pat.	2,009,913	(Bever)
" " "	503,903	(Curtis)
" " "	236,178	(Rice)
" " "	1,882,139	(Giuffre)
" " "	2,466,121	(Norman)

24. The Birambeau patent describes a hand-held pusher shaped to fit a spherical fruit such as a tomato, with slots designed to fit the blades in a hand-held (not patented) multiple blade slicer. The purpose of the invention was to permit the fruit to be forced all the way through the blades without cutting the operator's fingers. It operates through the placement of the pusher over a partly-sliced tomato, which is then put through the rack

of blades under the pressure created while pushing it through with a rocking back and forth motion.

25. The Bever patent describes an apparatus to slice buns into two or more parts. It consists of a heavy blade within a housing, together with a "J"-shaped pocket to pull a bun past the blade. The blade is fixed at an angle to the direction of its own motion.

26. The Curtis patent discloses an instrument to slice apples and other structurally solid fruit into multiple slices, with each slice positioned individually after cutting is completed, so that it may dry prior to canning. It is described as an improvement upon existing machines for that purpose. To perform this task, it relies upon an array of blades staggered one to another, and perpendicular to the motion of the pusher. To prevent distortion of the blades and resultant shredding of the

apple slices, the fingers of the pusher are engaged with the blades whenever the fruit is positioned between them. The blades themselves are perpendicular to the path of movement of the fruit. They are thick and rigid.

27. The Rice patent describes a rotary device, with a radial blade array staggered along a central axis which also supports a pusher. There is a right-angle relationship between the path of movement and the cutting surfaces of the blades. The pusher does not provide support for a tomato as it moves through the blades.

28. The Giuffre patent discloses an implement for passing a loaf of bread dough through a rack of fine wires, thereby cutting the loaf into multiple slices. The blade rack is mounted to move radially along an axis almost in the plane of the dough holder.

29. The Norman patent describes an

appliance for mechanical slicing of relatively rigid vegetables into convenient lengths for food preparation. The machine is nominally a rotary machine, and the blades, during the slicing process, are perpendicular to the path of movement of the fruit.

Obviousness

30. The basic elements of fruit and vegetable slicers, consisting of blades, pushers, bases, and means for relative movement, were well-known in the prior art.

31. The United States Patent Office has long recognized that innovation can exist in particular unique designs and original arrangments of otherwise general elements which may have existed separately or in different relationships in the prior art.

32. The peculiar qualities of tomatoes--their tough outer skin and soft, juicy interior -- create a critical problem of pressure build-up during slicing.

Plaintiff's solution embodies innovatice and unique developmental work which resulted in this invention.

Secondary Tests

1. Commercial Success

33. When placed on the market, the patented equipment enjoyed outstanding commercial success. Over twenty thousand units have been sold to a broad variety of food preparation and purveying establishments. The food preparation and food products sales industries have wholeheartedly received the slicer. Customer reaction has been uniformly enthusiastic.

34. No other device existed, until plaintiffs' invention came on the market, which could efficiently and economically slice tomatoes at a high rate of speed for food service operations.

35. The patented machine enjoyed such outstanding success that other manufacturers have developed competing

products which also perform the sole task of slicing tomatoes.

2. Filling a Long-Felt Need

36. No apparatus was available on the commercial market which could slice tomatoes rapidly, with minimum mess and waste, at a reasonable cost to potential users, before the emergence of the "Tomato Tamer".

37. Evidence with respect to prior patents establishes that specialized slicer markets have existed for many years.

38. The evidence has also demonstrated that a need existed for an effective, simple, and inexpensive tomato slicer for many years.

39. Plaintiffs' applicance has been accepted with unqualified approval by operators who run the gamut of food service enterprises.

3. Failure of Others

40. Prior to Mr. Giangiulio's

invention, no reasonably priced devices were on the market which could slice tomatoes efficiently, quickly, without waste and without temperament.

41. Demand for such a tomato slicer had existed for many years, and it created an incentive of long duration to develop a unit that would solve the problem peculiar to this particular foodstuff.

4. Copying

42. The "TK-I" was virtually a direct copy of the preferred embodiment of the '582 patent.

43. The incentive to copy the '582 patent was to compete with that machine for sales in the same market.

Invalidation Issues

1. Public Use

44. Whether it was an early version, or the final version of the slicer which was used for tests at the delicatessen prior to May 4, 1966, the machine was kept

from public view.

45. Irrespective of the particular unit which was subjected to testing at the delicatessen prior to May 4, 1966, the products of those experiments were destroyed, and were not consumed in sandwiches or platters that were publicly sold.

46. Any use of a final prototype for the purpose of slicing tomatoes, if such a machine were so employed more than one year prior to the May 4, 1967 filing date, was solely experimental, and for the sole purpose of definitively improving the equipment.

47. There was no sale or offering for sale of the subject of the patent to the public prior to May 4, 1966.

2. Failure to Set Forth the Best Mode

48. The '582 patent specification states the pusher is preferably made of a strong hard plastic. It has been found that a polycarbonate resin, a thermoplastic

material, is satisfactory. A suitable such resin is that sold under the trademark Lexan of the General Electric Co. The specification also states that "the pusher [is] preferably of plastic, although other materials may be used." Additional directions in the psecification establish that the pusher is to be impermeable to the liquids unleashed by a sliced tomato, and sufficiently rigid to permit it to push a tomato through the rack of blades.

49. The performance of the "Lexan machine" equals that of the aluminum machine when the width of the slots is the same on both pieces of equipment.

50. No specification as to the width of the slots was given in the patent. Instead, the patent claims and specifications disclosed that the pusher must mesh with the blades; thus these claims give guidance to anyone trying to fllow or understand the Claims.

51. The tooling costs for equipment to produce plastic pushers were estimated to have been at least $11,000 in 1966, and are, in fact, currently over $22,000. Aluminum pushers, however, can be made on existing equipment with an outlay of some $2000 for an extrusion mold. The cost differential was prohibitive for the small production run contemplated in 1966; it far outweighed any savings in labor which would result from the production of plastic pushers. Moreover, the same extrusion mold can be used for manufacturing any pusher, irrespective of the spacing of the slots and blades, while a new injection mold is required for each slicer which differs in size and spacing. This is a critical cost factor, because the only way to change the size of the slices is to change the spacing between the blades.

52. Regulations of the Food and Drug Administration have changed the grade

of "Lexan" required for use in equipment for food preparation. These regulations require a quality of "Lexan" which would cost more than five times as much as the material contemplated originally.

INFRINGEMENT

53. Defendant does not dispute its lack of authority from plaintiffs to use the '582 patent.

54. The material elements of claims 1 and 8 of the '582 patent are:/1

(a) base
(b) array of blades mounted on a base
(c) pusher assembly mounted on a base
(d) means to move the blades and the pusher assembly relative to each other
(e) pusher with a leading arm and a trailing arm
(f) pusher arms which create a tomato-holding pocket

/1 The phraseology is ours and is not a verbatim quote from the '582 patent.

(g) pusher arms with slots for the reception of blades
(h) blade array at an angle of less than forty degrees to the pusher path of movement
(i) angle between pusher leading arm and trailing arm that is greater than ninety degrees
(j) angle between pusher leading arm and cutting edge of blades that is less than thirty degrees
(k) small acute angle between trailing arm and cutting edge of blades; whereby
(l) the pusher achieves a smooth shearing action
(m) with the tomato urged against and through blades.
(n) with slots which allow the blades to pass through the fruit

The "TK-I"

55. The defendant has stipulated that the "TK-I" infringes at least some of the claims of the '582 patent.

56. The deposition evidence establishes that some sales (although the precise number is uncertain) occurred after the date of issuance of the '582 patent.

The "TK-II"

57. Defendant has stipulated that

there were sales after February 20, 1968.

58. None of the claims of the '582 patent can be read literally to cover the "TK-II" machine.

File Wrapper Estoppel

59. There was an initial rejection of all of the claims of the patent; some were rejected on ground of indefiniteness, and some on the basis of unpatentability, because of the existence of two prior art patents. Original claim 1 was rejected for both of these reasons.

60. The new claims 11 and 18, which were submitted after a conference with the patent examiner, were substantially identical to the original claim 1; the differences are found in the explanation of the angular relationships.

61. The new claims, with the clearer description of the means of measurement of the angles, were accepted by the patent examiner, and a patent issued on the

basis of these amended claims. The objection of lack of patentability was dropped.

Doctrine of Equivalents

62. The particular angular relationships related in the claims of the '582 patent's pusher are descriptive of a surface which can control and constrain the path of the tomato within specified limits.

63. The pusher of the "TK-II" controls and constrains the movement of the tomato so that it follows a designated and predictable path through the blades.

64. The pushers of the two tomato slicers ("Tomato Tamer" and "TK-II") are interchangeable without disrupting the operations of either machine.

65. The crucial phase of the cutting cycle is the first third, at which stage the skin of the tomato is pierced and slit.

66. The pushers of the "Tomato Tamer" and of the "TK-II" bring the tomato into contact with the cutting edges of the blades

along a path of movement which is at a shallow angle to those blades. Slicing at this shallow angle is maintained for at least the first third of the process.

DAMAGES

67. The case has been bifurcated and assessment of damages, if any, has been deferred, pending disposition of the liability aspects of the matter.

III. DISCUSSION

Background of the Patent in Suit

Application Serial No. 636,176 was filed with the United States Patent Office on May 4, 1967. Prior to that time, those engaged in the myriad operations which are part and parcel of the food service industry sliced tomatoes through any number of methods.

Employees could be detailed to slice tomatoes by hand with ordinary paring or kitchen knives, the same technique which is most commonly employed when tomatoes

are prepared for domestic consumption in the home. While this procedure may be suitable for occassional small-scale tomato slicing, it has serious drawbacks in large-scale feeding operations. Testimony adduced at the trial established that one large restaurant in the Philadelphia suburban area, for example, required over 20,000 slices of tomatoes each week. Volume of this magnitude makes hand slicing impractical. Fastfood operations also use vast quantities of sliced tomatoes, as do institutional operators. At the other end of the scale are the delicatessen and "hoagie" shops, which use sliced tomatoes as a staple for sandwiches and platters purveyed for retail on-the-spot, or take-out consumption. Volume of use in these establishments, obviously, is sharply below that of the large chains and restaurants, but the need to have slices instantly available for rush periods, with suitable

storage during slack hours, is critical to the operation of these businesses. In all of these situations, time-consuming preparation by hand is economically unsatisfactory.

Problems presented by hand slicing are detailed in Finding of Fact 6; they relate to speed, uniformity, safety, waste, hygiene, spoilage, and the need for advance preparation and storage during peak needs. This evidence supports the finding that manual slicing was not, and is not satisfactory for commercial food service.

Attempts to mechanize the slicing of tomatoes have met with uneven success. Large multi-purpose machines are available from manufacturers such as Hobarth, but the price of $2400 or more per machine is one that may be prohibitive to the small commercial user, thus putting this equipment beyond the reach of the average private entrepreneur who owns or operates

a delicatessen or small restaurant. Electric meat-slicers are, at times, used to slice tomatoes. These machines usually cost $500.00 each, or more. However, this machinery is primarily designed for meat slicing, and utilization for tomato preparation requires diversion from the intended purpose. Other problems, as detailed in Finding of Fact 7, also make this machine unsatisfactory for slicing tomatoes on a commercial scale.

The variety of hand-operated vegetable slicers simply cannot slice a tomato. Thus, from the evidence presented on this score, we conclude that a reasonably priced tomato-slicing device, which was capable of doing the job in an afficient and economical manner was not available to the food-service trade. Moreover, none existed which did not have serious attendant difficulties and disadvantages. It was against this backdrop that Mr. Giangiulio developed the invention that is the basis

of the patent in suit.

The development and nature of this patent are the subject of Findings of Fact 10 through 22. These have been analyzed on the basis of the documents and other evidence that constitute the record in this case. Repetition of the salient facts is superfluous. Therefore, we will proceed to a review of the legal questions raised by this litigation. The threshold issue is the validity of the '582 patent.

VALIDITY

We have concluded from the information cited in the introduction to this opinion that the '582 patent possesses both novelty and utility. 35 U.S.C. §§101-02. The validity question is essentially threefold: (1) Anticipation - Was the patent disclosed in the prior art? (2) Obviousness - Was the patent a natural, non-innovative outgrowth of the prior art? (3) Invalidation - Has the privilege of

patent protection been defeated by certain actions or inactions of the inventor?

Within this structure, several additional factors must be considered. In deciding the issue of anticipation, the prior art must be determined. In discussing obviousness, one looks at the level of skill in the field, the nature of the change from the prior art, and the input from the secondary tests for commercial success: filling a long-felt need, failure of others, and copying. Invalidation encompasses the issues of public use and failure to state the best mode. We will discuss each of these factors within the framework of the particular parent issue to which it is subsidiary.

Anticipation

The defendants have cited six patents, one of which is a foreign patent, in order to establish the scope and the content of the prior art. See 35 U.S.C. §102. These patents

are as follows:

French Patent	1,085,144	(Birambeau)
United States Pat.	2,009,913	(Bever)
" " "	503,903	(Curtis)
" " "	236,178	(Rice)
" " "	1,882,139	(Giuffre)
" " "	2,466,121	(Norman)

We will discuss each seriatim.

1. The Birambeau patent describes a hand-held pusher shaped to fit a spherical fruit, such as a tomato. The pusher has slots which mesh with a hand-held rack of thin blades. The patented device was designed to solve a problem created by the hand-held slicer. One introduces a tomato into the blades and saws through it with a reciprocating motion. At a certain point, the blades get very close to the operator's fingers. The operator may at that point move his hand to the underside and pull the tomato through. The pusher allows the operator to continue pushing, and eliminates the danger of cutting his own fingers along with the tomato. The tomato slicing must be started by hand, and the device will

complete the process only after initial slicing by hand. We conclude that this machine does not foreshadow or disclose a mechanical, high-speed, single-pass slicer such as the subject matter of the patent in suit.

2. The Bever patent was designed as a bun slicer. Its avowed purpose was to split buns into two or more slices. It consists of a heavy blade placed at an angle to the direction of motion, and a "J"-shaped pocket designed to pull a bun past the blade. The pocket design of the Bever patent does not restrain a tomato, so that it passes cleanly through a blade, or an array of blades; the blade design is incapable of passing cleanly through a tomato and producing multiple slices. No reasonable adaptation of the machine will perform such a function. Hence, we conclude that the Bever patent neither suggests nor discloses the subject matter of the patent

in suit.

3. The Curtis patent describes a device designed to slice apples and other structurally solid fruit into individual pieces which are separated in the process so that they may dry prior to canning. The patent describes itself as an improvement upon existing machines for that purpose. To produce slices and lay them out separately, it uses an array of blades that are staggered one to another. The blades are laid out perpendicularly to the path of movement of the fruit and pusher. In order to prevent distortion of the blades and the resultant shredding of the apple slices, the fingers of the pusher are engaged in the blades whenever the fruit is situated between them. The patent thus presents yet another example of known elements, (pusher, blade rack, base), performing the operation of slicing a particular kind of fruit in a particular manner for a

particular purpose. The device is incapable of high-speed, repetitive slicing of a tomato into multiple slices; it would destroy the structural integrity of the fruit. The blades are at a perpendicular to the path of movement. They are also quite thick and rigid, and thus cannot slice an entire tomato rapidly at a single pass. The pusher design is utterly incapable of supporting and guiding a soft fruit through the blades without totally demolishing it. The Curtis patent does not disclose or suggest the subject matter of the patent in suit.

4. The Rice patent was also designed for slicing apples and other structurally rigid fruit. It consists of a rotary device, with a radial array of blades staggered along a central axis which also supports a pusher. The relationship between the path of movement and the blade line is tangential at any blade; that

is, at a perpendicular. If the Rice device were utilized in an attempt to slice a tomato, it would destroy it. The angle between the pusher and the blades is such that those members would squeeze and thus obliterate the fruit; moreover, there is not enough support for the tomato as it passes through the blades. The patent does not itself disclose or suggest a successful, high-spped, mechanical tomato slicer such as the subject matter of the patent in suit.

5. The Giuffre patent describes a device for slicing a loaf of raw bread dough into a row of individual slices. This is achieved by passing a rack of fine wires through a loaf of dough on a slotted holder. The rack of wires is mounted so as to move radially along an axis almost in the plane of the dough holder. Such a machine is not capable of slicing a tomato cleanly; in all probability, it would dent or squash the tomato. No obvious modifications would

overcome the problem. The blade line is essentially at a right angle to the path of movement during the entire slicing operation. The blades could not provide the resistance to flexing necessary to pierce the skin. The Giuffre patent does not disclose or suggest the subject matter of the patent before us.

6. The Norman patent discloses a device for mechanical hand slicing of a relatively rigid vegetable into convenient lengths for preparation for consumption. Essentially, the slicer is a rotary machine with the pusher pivoting along an axis in the plane of the stationary blades. The relative path of movement of the fruit is perpendicular to the blades. The Norman machine could not slice tomatoes cleanly, smoothly, or quickly. Hence, we conclude that the Norman patent does not disclose or suggest the subject matter of the patent in suit.

Thus, an analysis of the prior art leads us to conclude that plaintiffs' patent was neither disclosed, nor suggested by it. We also have determined that the prior art consisted of designs for pushers, blade racks, means of moving the pushers and the blade racks, both separately as well as in relation to each other, and bases to support the entire mechanism. All or some of these elements can be and have been arranged in specific patterns in order to accomplish particular functions.

Obviousness

The prior art is reflected in a variety of slicers and choppers, each designed to deal with the specific probelms which are peculiar to a variety of individual foods and to perform different tasks in connection with the cutting or slicing of particular foodstuffs. While it is true that the individual components and elements are well known in the prior

art, there is a synergistic result obtained through particular relationships among them. Trio Process Corp. v. L. Goldstein's Sons, Inc., 461 F.2d 66, 71 (3d Cir.), cert. denied, 409 U.S. 997 (1972). See 35 U.S.C. §103.

We find that the crucial development work on this patent was the result of a pinpointed analysis of the difficulties in slicing tomatoes in large quantities, which thereafter resulted in the creation of a device to solve these particular problems. We refer to the difficulty of pressure build-up and the related obstacles that are caused by the combination of a tough outer skin and an interior with no structural integrity. The solution required development of a process for piercing the tough outer skin without creating interior pressure that would destroy the soft internal mass of the fruit. Thus, the key to the solution was putting together known elements -- blade racks, pushers, means for

relative movement, supporting bases -- in an assembly which would perform this task quickly, smoothly, and economically without either waste of the food itself, or of the time of the operator performing the function. Nothing in the prior art could accomplish this.

We note that the prior art did, in fact, consist of patents issued for machines designed to solve the particular slicing problems peculiar to individual foodstuffs; this further buttresses plaintiffs' thesis that the United States Patent Office has frequently found patentable innovation in solutions which overcome the unique dilemnas associated with the mass cutting or slicing of particular foods. Patents are presumed valid. 35 U.S.C. §282. This is particularly so when, as in the instant case, significant prior art is cited. See, e.g., Anderson Co. v. Sears, Roebuck & Co., 265 F.2d 755

(7th Cir. 1959). The recurring pattern of patent issuance for means which deal with specialized problems further suggests that we examine this patent with a presumption of validity.

There was no additional evidence submitted to establish the ordinary level of skill in the art. We have determined from the patent material submitted by the defendant and discussed above, that the ordinary level of skill in the art of food slicing is that possessed by an individual performing that task. Our conclusion is based on the following factors: (1) the central factor in the development of a food slicer is the identification of the unique problems associated with the preparation of a particular category of fruits or vegetables; (2) while diverse elements of food slicers are well-known in the art, it is the synergistic result of arranging these elements

in a specific manner that is significant in the issuance of a patent for the invention; (3) it would be unusual for an engineer to have either the need for such a device, or the method of accomplishing the desired result; and (4) the activity of an engineer in those circumstances would be cumulative toward a successful embodiment of the concept, and not independent of the actual creative work involved in isolating the problems before arriving at a solution.

This conclusion is consistent with the result in prior cases which have held that patentable invention can lie in the as in the actual construction of an embodiment of that solution. 1 Deller's Walker on Patents 2d ed. §43 (1964).

We have heard the evidence of defendant's expert engineering witness. We understand his testimony to mean that slicers are interesting developments of known technology and that, while a particular

slicer may be an extremely efficient, and well-designed piece of machinery, there is no invention in putting a slicer together. However, in light of the prior art, and of our determination of the ordinary level of skill in the art, we disagree with his opinion as to the obviousness of the '582 patent. This does not mean that one could validate a patent for a different slicer for each fruit or vegetable that is purveyed in the United States. What we hold is that the problem posed by the need to find a fast, efficient, and economical way to slice tomatoes in large quantities did present the singular challenge that called for a unique answer. We find that the subject matter of the '582 patent is not obvious to an individual possessing the average level of skill in the art, in light of the prior art existing at the time the invention was developed and the application was filed; the inventor of the

'582 patent, Clayton Giangiulio, did not know of the existence of any device which suggested to him the machine de devised. Rather, the '582 patent was the product of his own independent and original development, and hence we disagree with defendant's contention of obviousness from the prior art.

Secondary Tests

This conclusion is buttressed by the evidence relative to the secondary tests to be considered. The criteria are set forth in Graham v. John Deere Co., 383 U.S. 1 (1966), and recently were repeated in the Third Circuit's opinion in Trio Process Corp. v. L. Goldstein's Sons, Inc., 461 F.2d 66, 70-71 (3rd Cir.), cert. denied, 409 U.S. 997 (1972). These tests include commercial success, filling a long-felt need, failure of others to develop the invention, and copying by others. We will discuss each category separately.

1. Commercial Success

There is overwhelming evidence of the immediate and astounding commercial success of Plaintiffs' invention in the market. Sales records show that over 20,000 slicers have been sold since the first production commenced in mid-1967. This sales volume is extremely significant, because most purchases are one-time affairs, with replacement parts only, such as new blades, the subject of reorders thereafter. Furthermore, there has been virtually no advertising by the plaintiffs, with the result that most of the purchases came through recommendations by satisfied customers to other potential users.

The testimony was undisputed with respect to the exceptional performance of the "Tomato Tamer" in achieving the desired goals for its users. A diverse market exists, ranging from large institutional and fast-food chain operations to smaller

restaurants and local sandwich shops.

The sales results point up the significance of the secondary test of commercial success -- the reception given this device in the market place is an indicator of the innovative character of this patent. The test is not one which is determinative of validity. However, it does help "to give light to the circumstances surrounding the origin of the subject matter sought to be patented." Graham Tank, supra, at 17-18. The reaction in the market place is a factor to be considered by the Court, which is most ill-fitted to discharge the technological duties cast upon it by patent legislation***. In serves to "'guard against slipping into use of hindsight,'***and to resist the temptation to read into the prior art the teachings of the invention in issue." Id. at 36. Thus, the test provides practical guidance to the Court, even though it is not legally dispositive

of the issue of validity. We conclude that the evidence of commercial success of the "Tomato Tamer" is additional support for the proposition that it is a new and useful innovation worthy of patent protection.

2. Filling a Long-Felt Need

This secondary test is akin to the tests of commercial success and failure of others to achieve that success. That a receptive market, which was not satisfied, existed for this device over a long period of time suggests that others would be striving to produce the subject matter of this patent, and hence underscores the conlusion that the invention was not obvious to those who did work on it. Evidence was presented at the trial which demonstrated the absence from the market of a commercially feasible machine which could slice tomatoes for mass food preparation.

We are satisfied that an eager food trade was waiting for such equipment with

increasing need and desire as mass food operations have grown over the years. That market has not, as defendant has argued, been created solely by the development of the fast-food industry. The diversity of the good operations of the purchasers contradicts defendant on that score. Indeed, the food slicer patents introduced into evidence by defendants go back many decades, and reveal that the long chain of efforts to develop specialized slicers is not a new development. To the contrary, we find that a market has existed for well over a decade for a machine which would eliminate slicing tomatoes by hand, and would also obviate the necessity of using expensive electric machinery for that same purpose. The "Tomato Tamer" has been widely acclaimed for its ability to satisfy those needs in the market for which it was designed.

3. Failure of Others

Prior to the introduction of plaintiffs'

device, no products on the market existed that were capable of performing the task which plaintiffs' invention so successfully performs. We are satisfied, as noted, that the market for this equipment existed for an appreciable period of time, at least in excess of a decade, and that such a market indeed created an incentive for inventors to produce a successful tomato slicer. The inference is that other potential inventors would have developed such a slicer, had they been able to do so. The vacuum which existed until Mr. Giangiulio invented his machine is again valid secondary evidence of the non-obviousness of the subject matter of the '582 patent.

4. Copying

Evidence was put before the Court that a tomato slicer, known as the "TK-I", and marketed at one time by the defendant, was developed by non-parties to compete with the machine produced by plaintiffs. The

machine was apparently developed from a description of the "Tomato Tamer". It has been stipulated that the "TK-I" device, which was manufactured by Redco, infringed upon some of the claims of plaintiffs' patent. In fact, but for some significant stylistic details, the "TK-I" is a virtual copy of the "Tomato Tamer"; thus, the evidence establishes that the "TK-I" was produced in order to compete with the plaintiffs' machine on the market.

While it is clear that there is no legal impediment to copying an unpatented article, see Sears, Roebuck & Co. v. Stiffel Co., 376 U.S. 225, 231 (1964), and the evidence of copying prior to issuance of a patent is therefore irrelevant to the issue of infringement, such evidence may be pertinent for other purposes. See Troy Co. v. Products Research Co., 339 F.2d 364, 367 (9th Cir. 1964), petition for cert. dismissed, 381 U.S. 930 (1965) Cf.

Substests of "Nonobviousness": A Nontechnical Approach to Patent Validity, 112 U.Pa. L.Rev. 1169, 1178-80 (1964). The inferences that may be drawn from copying here are twofold. First, copyign suggests that there was significant innovation in the invention which has been patented. Second, it suggests that the invention is significantly useful so that competitors must react in some way if they are to remain in business. While neither of these inferences can be considered in connection with the threshold question of obviousness, they are significant secondary indicators and are relevant to a finding of non-obviounsess.

All of the pertinent secondary tests support the conclusion that the '582 patent is preliminarily valid, and has met the fundamental tests of novelty, utility and non-obviousness.

Invalidation Issues

Even though an invention may be found

patentable under the basic tests found in 35 U.S.C. §§101-103 (Utility, novelty, non-obvious subject matter), the patent may yet be invalid for failure to meet several other secondary conditions. The rationale for these qualifications stems from the purposes of the patent laws, designed as they are, to "preomote the Progress of***useful Arts, by securing for limited Times to***Inventors the exclusive Right to their***Discoveries". U. S. Const. art. I, §8. Because the Constitution envisaged a limited monopoly in return for full disclosure of the invention, and because progress was felt to be enhanced by disclosure of invention and hindered by secrecy, the statutes of Congress which were derived from the constitutional clause have all included incentives for speedy and full disclosures. These incentives may also be viewed as penalties, through denial of patentability, when there is failure to note a prompt, complete, and

public dislcosure of the subject matter of the invention. See Graham v. Jon Deere Co., supra. In the case at bar, defendant has averred that plaintiffs' non-compliance with two fundamental precepts has invalidated the patent, and the challenged conduct consists of: First: the alleged public use of the patent's subject matter more than one year prior to the filing of the application in contravention of the provisions of 35 U.S.C. §102, and, Second: the alleged failure on the part of the inventor to set forth the best mode contemplated by him for carrying out his invention, as required by 35 U.S.C. §112. We will deal with each point separately.

1. Public Use

The public use doctrine is derived from 35 U.S.C. §102(b):

> §102. [in pertinent part]
>
> A person shall be entitled to a patent unless--

> ***
>
> (b) the invention was***in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States***.

The Supreme Court has held this concept to mean that any use for profit, or other competitive exploitation of an invention for more than the permitted period after the invention is patentable will invalidate the patent. /2 Judge Leanred Hand has suggested that the limitation may be viewed as a period of grace during which the inventor is given time to decide whether to prepare the application. /3 If that period of time is exceeded, he suggests that the inventor is left with the choice of secrecy, or of no protection of any kind.

/2 Electric Storage Battery Co. v. Shimadzu, 307 U.S. 5,20 (1939).

/3 Metallizing Engineering Co. v. Kenyon Bearing & A.P. Co., 153 F.2d 516, 520 (2d Cir.), cert. denied, 328 U.S. 840 (1946); Aerovox Corp. v. Polymet Mfg. Corp., 67 F.2d 860, 862 (2d Cir. 1933). When the earlier case was decided, an inventor was allowed two years of public use.

In the instant case, the patent application was filed on May 4, 1967. The question, therefore, is whether there was a patentable machine or invention prior to May 4, 1966, and, if so, whether there was commercial use of that invention prior to May 4, 1966. The evidence presented to the Court shows that the final embodiment of the invention was not ready as of March 30, 1966. On that date, Mr. Giangiulio was advised by a patent attorney to return to the workbench for further development of the slicer. There was evidence that experiments were conducted by Mr. Giangiulio at the delicatessen which he formerly owned, subsequent to the March 30 date and prior to May 4, 1966. It is not clear from the evidence which machine -- the final version or an intermediate experimental version -- was used for these experiments. However, we find it unnecessary to decide that question. Even assuming that the machine

used was the final embodiment of Mr. Giangiulio's idea which was then presented to the patent attorney on May 24, 1966, we have not been convinced that any products of the machine were used for commercial purposes or for profit. Wer are pursuaded that the invention was kept in secrecy while in development, and that any usable model of the slicer was kept from general public view. We have also concluded from the evidence before us that tomato slices made on the slicer were destrobyed, and not used in sandwiches for public sale. Any slicing of tomatoes was entirely experimental with a view toward further development and improvement of the invention, and thus did not cause the statutory period to begin to run. Defendant has not met the burden of proof required to establish this affirmative defense.

We note for the record at this point that there is a dispute between the

parties as to whether the applicable standard of proof is "clear and convincing" or "beyond a reasonable doubt."[/4] It is unnecessary to resolve this issue because defendant has not presented evidence that would even satisfy the lesser standard.

2. Failure to Set forth the Best Mode

The rule of invalidation for failure to set forth the best mode is derived from 35 U.S.C. §112:

§112. [in pertinent part]

The specification***shall set forth the best mode contemplated by the inventor of carrying out his invention.

/4 Defendant cited the following for the proposition that the standard is by "clear and convincing evidence": Julian v. Drying Systems Co., 346 F.2d 336 (7th Cir. 1965). Plaintiffs, who propound the standard of "beyond a reasonable doubt", have cited: Jones Knitting Corp. v. Morgan, 361 F.2d 451, 455 (3d Cir. 1966).

This statutory directive is designed to further the general purposes of the patent laws by requiring disclosure of the best method of performing the task the patent is intended to accomplish, so that the public may obtain maximum benefits through complete revelation by the patentee, the quid pro quo for the grant of a legal monopoly over the subject matter. Hence, the statute requires good faith statements of the best method of achieving the desired result known to an appreicated as such by the inventor. Defendant relies upon Engelhard Industries Inc. v. Sel-Rex Corporation, 253 F. Supp. 832, 837 (D.N.J. 1966), aff'd, 384 F.2d 887 (3d Cir. 1967), for the appropriate standards to be applied in determining if the patentee has satisfied this statutory requirement. That opinion cites with approval the following language from Benger Laboratories Ltd. v. R.K. Laros Co., 209 F. Supp. 639, 644 (E.D. Pa. 1962),

aff'd per curiam, 317 F.2d 455 (3d Cir.), cert. denied, 375 U.S. 833 (1963):

> A patentee must disclose the best method known to him to carry out the invention. Even if there is a better method, his failure to disclose it will not invalidate his patent if he does not know of it or if he does not appreciate that it is the best method. It is enough that he act in good faith in his patent disclosure. On the other hand, if he knows at the time the application is filed, of a better method to practice the invention and knows it for the best, it would make no difference whether of not he was the discoverer of that method.

Defendant states that the pusher of the machine was changed from "Lexan" (a specific kind of thermoplastic resin) to aluminum in the final commercial version which has been marketed by plaintiffs, because the "Lexan" pusher did not operate as well as aluminum; hence, Kidde argues that the consistent use of aluminum in all machines that have been made and sold establishes that there was a failure to state the best mode of carrying out the invention in the patent, which

had described "Lexan" as a possible pusher material. See Finding of Fact 48. Kidde, thereafore, contends that we must invalidate the '582 patent for failure to adopt the best mode, just as the court did in Engelhard Industries, supra. We disagree.

First, the specification in the patent states only that "the pusher [is] preferably of plastic, although other materials may be used." In the same specification, a particular plastic is suggested. Additional directions in the specification make it clear to the user of the patent that the pusher is to be impermeable to the liquids unleashed by a sliced tomato, and rigid so as to permit it to push a tomato through the racked blades. See Findings of Fact 48. We conclude that the specification adequately discloses the criteria for selecting pusher material and that whle it suggests one possible material, it does not limit the choice to that plastic exclusively.

Second, the "Lexan machine" can be

operated properly. The difficulty to which defendant refers is the occasional catching of a pusher arm on the blades, thereby jamming the machine. For this litigation, Mr. Giangiulio prepared a machine with a "Lexan" pusher which did not have this difficulty. A simple change in the slots on the pusher solved the problem. By widening the area between the slots so that the spacing is the same as that of aluminum pushers, the supposed defect was rectified. Slot width was not specified in the patent. It was clear that the pusher would have to engage the blades. Any individual of average skill in the art would realize that the slots must be sufficiently wide to permit free passage of the pusher arms through the blade rack. Thus an adequate description of the method for obtaining a properly performing plastic pusher was made.

On this basis alone we are satisfied to reject defendant's contention. However,

there are additional factors which support this conclusion. There was considerable testimony at the trial relative to the selection of aluminum as the material for the pusher. We accept the uncontradicted statements of Mr. Giangiulio that he chose aluminum when the Food and Drug Administration changed its regulations and required a special grade of "Lexan" to be used in food processing equipment. This grade costs over five times as much as standard commercial "Lexan" material. In addition, an investigation into tooling costs for "Lexan" disclosed that the special dies needed for injection-molding the plastic would have cost at least $11,000 in 1966. That tooling cost has continued to rise to over $22,000 now. In contrast, the aluminum pusher can be made on existing equipment with specialized tooling of only $2,000 for an extrusion mold. The differential in the cost of labor, which is higher for aluminum pushers than for

plastic pushers, does not come close to this significant initial tooling cost. Moreover, a new injection mold would be required for each prototype that has blades which bear different spatial relationships to each other if the pusher were made of plastic, while only one extrusion mold is required, irrespective of the width of the spacing between blades when the pusher is made of aluminum.

The rule in Engelhard Industries and in Benger Laboratories, supra, is good faith in the choice of methods disclosed. If an inventor does not appreciate that one method is better than another, he is not to be penalized for failure to give the alternative method. We are satisfied that Mr. Giangiulio did not knowingly choose to disclose other than that which he believed to be the best method at the time. We are persuaded that he made his choice for disclosure in complete good faith, and

that he thought that plastic was in fact the best mode for carrying out the invention. Moreover, the evidence does not support the contention that plastic is not the best mode; plastic is an available and satisfactory material as set forth in the specification.

Finally, we have examined the original opinion in Benger Laboratories. Immediately before the passage cited in Engelhard Industries, Judge Kirkpatrick stated:

> The defendants' argument depends for most of its force upon the fact that the plaintiff has from the beginning used in its commercial production a method differing in some particulars from any method of manufacture disclosed by the patent and has been conspicuously successful in marketing its product on a world-wide scale. Of course, there may be many reasons why the plaintiff adopted this method in preference to others, and I do not regard the fact that a patent owner adopts a certain method for its commercial production as by any means conclusive or as compelling a finding that it is the best method although it must, of course, be considered. There is also

> always a question as to what is meant by the "best" method. There could easily be cases where reasons of economy or other considerations would call for the use of a certain method for production on a large commercial scale, although a greatly superior product might be produced if smaller quantities were desired.

Benger Laboratories, supra, at 644. We believe that this observation squares with our decision in this case, and that the result is consistent with accepted precedent in this Circuit, and with the general law on the subject.

Thus we conclude that, given all the primary and secondary tests, as well as consideration of the affirmative defenses, the '582 patent is in fact valid. The only remaining issue at this stage of the litigation is that of infringement.

INFRINGEMENT

Defendant has sold two models of machines which allegedly infringe the '582 patent -- the "TK-I" and the "TK-II".

The issues with respect to infringement are distinct as to each of them.

The statutory section governing infringement is found in 35 U.S.C. §271(a):

> [W]hoever without authority makes, uses or sells any patented invention, within the United States during the term of the patent therefor, infringes the patent.

Three separate elements must be established before there can be a finding of infringement: (1) the invention be made, used or sold (2) during the term of the patent (3) by one without authority to do so.

1. Alleged infringement by the "TK-I"

Kidde does not dispute that it lacked authority to use the patent. Indeed, the parties stipulated that the "TK-I" infringed some of the claims of the '582 patent. The only issue in dispute is whether there was such use during the term of the patent. One of defendnat's agents, the General Manager, suggested

that sales dropped off sharply after introduction of the "TK-II", which was prior to the issuance of the '582 patent on February 20, 1968. Another agent of defedant, the Restaurant Products Manager, gave a firmer cutoff for sales, at a period in mid- to late 1968. We are persuaded that some sales in all probability did take place after the issuance of the '582 patent. An accounting, which will be ordered in connection with the determination of damages, will reveal the amount of sales, so that damages, if any, may be calculated with certainty.

2. Alleged infringement by the "TK-II"

Similarly, Kidde does not assert authority to use the '582 patent. In this connection, the parties have stipulated that sales occurred after February 20, 1968. The question is whether the "TK-II" "used" the '582 patent. The primary test for use is what is known as

literal infringement. The allegedly offending product is examined to see if each and every element of a claim of the patent is present in that product.

In the words of Mr. Justice Jackson:

> In determining whether an accused device or composition infringes a valid patent, resort must be had in the first instance to the words of the claim. If accused matter falls clearly within the claim, infringement is made out and that is the end of it.

Graver Tank & Mfg. Co. v. Linde Air Prod. Co., 339 U.S. 605, 607 (1950). We have determined the elements of the '582 patent in order to comply with this directive. See Finding of Fact 54. The plaintiffs have argued ingeniously to convince us of the literal infringement of these elements. However, it is just not credible that the detailed provisions of claims 1 and 8 of the '582 patent are literally present in the "TK-II".

Failure to find literal infringement does not end the matter, however, the guidelines of Graver Tank, supra, are still the rule in this Circuit. See Trio Process Corp. v. L. Goldstein's Sons, Inc., supra. The Court in Graver Tank refused to subordinate substance to form by demanding precise literalness, a rule that would make a mockery of patent protection. An imitation can be substantially the same as the claimed patent, while not falling absolutely within its literal bounds. The doctrine of equivalents therefore becomes significant in developing realistic protection for a patentee. The doctrine, which is effective both for a primary invention and for a combination invention, is based upon the thesis that "'if two devices do the same work in substantially the same way, and accomplish substantially the same result, they are the same, even though they

differ in name, form, or shape."/5

/5 This quote occurs in the context of the following declamation of patent protection:

> But courts have also recognized that to permit imitation of a patented invention which does not copy every literal detail would be to convert the protection of the patent grant into a hollow and useless thing. Such a limitation would leave room for - indeed encourage - the unscrupulous copyist to make unimportant and insubstantial changes and substitutions in the patent which, though adding nothing, would be enough to take the copied matter outside the claim, and hence outside the reach of law. One who seeks to pirate an invention, like one who seeks to pirate a copyrighted book or play, may be expected to introduce minor variations to conceal and shelter the piracy. Outright and forthright duplication is a dull and very rare type of infringement. To prohibit no other would place the inventor at the mercy of vertalism and would be subordinating substance to form. It would deprive him of the benefit of his invention and would foster concealment rather than disclosure of inventions, which is one of the primary purposes of the patent system.
>
> The doctrine of equivalents evolved in response to this experience. The essence of the doctrine is that one may not practice a fraud on a patent. Originating almost a century ago in the case of Winans v. Denmead (US) 15 How 330, 14 L 3d 717, it has been consistently applied by this Court and the lower federal courts,

(Con't.)

/5 Continued

and continues today ready and available for utilization when the proper circumstances for its application arise. "To temper unsparing logic and prevent an infringer from stealing the benefit of the invention" a patentee may invoke this doctrine to proceed against the producer of a device "if it performs substantially the same function in substantially the same way to obtain the same result."

***

The theory on which it is founded is that "if two devices do the same work in substantially the same way, and accomplish substantially the same result, they are the same, even though they differ in name, form, or shape."

***

The doctrine operates not only in favor of the patentee of a pioneer or primary invention, but also for the patentee of a secondary invention consisting of a combination of old ingredients which produce new and useful results.

Graver Tank & Mfg. Co. v. Linde Air Prod. Co., 339 U.S. 605, 607-08 (1950) (footnotes and citations omitted).

File-Wrapper Estoppel

Prior to considering the application of the doctrine of equivalents in this case, we will dispose of defendant's allegation of file-wrapper estoppel. Absence of file-wrapper estoppel is a condition precedent to consideration of the doctrine of equivalents. A positive finding of file-wrapper estoppel will bar invocation of the doctrine of equivalents by a patent-holder.

The genesis of the estoppel rule lies in the nature of the proceedings in obtaining a patent. When an application is filed, it triggers a review of the application and of applicable prior art in order to determine whether the application presents the innovation necessary for the grant of patent rights. The examiner may decide that the patent is not sufficiently innovative. He may decide that the subject matter is unpatentable under the patent laws. He may find that there is insufficient clarity in the papers to explain the invention to others. If the examiner finds, for any

reason, that a patent should not be granted, he issues a rejection with an explanation of his reasons. This becomes part of the file-wrapper, which is the official case-history of the patent application. An inventor is not foreclosed at this point from obtaining a patent. The failings cited as the basis for rejection may be rectified. A subsequent re-application may be submitted under the same number and file. Ultimately, a patent may be granted. The issue of file-wrapper estoppel relates to the eventual grant of a patent which is the result of this give-and-take. If the preliminary rejection was for obviousness or overbreadth of the subject matter, and the patent was then granted upon the inventor's narrowing the scope of his claims to avoid covering unpatentable or prior-patented material, that inventor may not then have recourse in the courts to recover what he voluntarily abandoned

in order to receive the patent.

Thus, a finding of file-wrapper estoppel means that the inventor had earlier given up certain claims with respect to his patent that he is now attempting to assert through the doctrine of equivalents in order to establish a basis for his charge that the patent has been infringed.

In the instant case, there was an initial rejection of all of the original claims of the application. The reasons assigned were, in the case of certain claims, including original claim 1, indefiniteness, and, for some claims, again including original claim 1, unpatentability in view of two prior art patents. A conference was requested by counsel for Mr. Giangiulio. As a result of this conference, new claims were submitted. New Claims 11 and 18, which were accepted and became claims 1 and 8 in the '582

patent, differed from the original claim 1 almot entirely in the explanation of the angular relationships. The basis for the complaint of indefiniteness had been the patent examiner's contention that he could not relate tne angles to any physical structure, and thus could not decipher the patent claims. The new description of the angles satisfied the examiner. The objection of unpatentability in view of prior art was dropped without any narrowing or refinement of the claims. In light of this history, which has been documented in exhibits that are part of the record, and which has also been the subject of oral testimony by all parties, we conclude that there has been no narrowing of the substance of the claims for the purpose of obtaining a patent in view of prior art, and therefore, the doctrine of file-wrapper estoppel does not apply. See Trio Process Cor. v. L. Godstein's Sons, Inc., 461 F.2d

66, 75 (3d Cir.), cert. denied, 409 U.S. 997 (1972). Hence we may consider the doctrine of equivalents.

Doctrine of Equivalents

At first blush, the doctrine of equivalents appears to create a philosphical paradox. We distinguished this invention from other slicing devices in holding that it is valid. Yet now we say we can rely on the doctrine of equivalents to decide the issue of infringement. Have two different and contradictory standards been applied in determining validity in the first instance, and infringement thereafter? The explanation arises from the factor of innovation in this invention which led us to uphold its validity -- the solution of the problem of slicing tomatoes mechanically, at a rapid rate, without mangling them. These were, as we have noted, problems which were peculiar to tomatoes.

None of the other patents was capable

of slicing tomatoes, even though they all consisted of blades, pushers, bases, and means for movement. It was the arrangement and the special relationships among those elements which made other specialized fruit or vegetable slicers patentable. It is the special angular relationship between the pusher and the blade rack which sits at the center of this invention. It is the technique which makes the invention. Hence, the patent is valid.

What then is the rationale of squaring this finding of validity with one of infringement based on the doctrine of equivalents? The latter ule has been developed to give an inventor complete protection of his patent rights. The rule permits a court to determine what elements are non-essential (given the premise that every stated element is essential), and what differences in form actually are insignificant. One might understand the rule to permit the Court to

find infringement when the essence of an invention is used, even though the superficial form may be different.

The definitive statement of the rule has been cited in the Graver Tank case. The broad outlines of the test to be applied are as follows:

> What constitutes equivalenecy must be determined against the context of the patent, the prior art, and the particular circumstances of the case. Equivalence, in the patent law, is not the prisoner of a formula and is not an absolute to be considered in a vacuum. It does not require complete identity for every purpose and in every respect. In determining equivalents, things equal to the same thing may not be equal to each other and, by the same token, things for most purposes different may sometimes be equivalents. Consideration must be given to the purpose for which an ingredient is used when combined with the other ingredients, and the function which it is intended to perform.

Graver Tank, supra, at 609.

The issue in Graver Tank was whether an electric welding flux containing a manganese compound infringed a patent for an electric welding flux containing a magnesium compound. In a landmark decision on this point, the Supreme Court first found no literal infringement. It then applied the doctrine and found that there was infringement, because the maganese compound "'perform[ed] substantially the same function in substantially the same way to obtain the same result.'" Graver Tank, supra, at 608.

A great deal of testimony was developed in the instant case to demonstrate the purposes behind the design of the pusher and the nature of the path of movement. Expert witnesses were called by both sides to explain their points-of-view, to give engineering descriptions of the machines in operation, and to demonstrate

the functional equivalence or dissimilarity between the "TK-II" and the '582 patent. Several bushels of tomatoes were sacrificed in live demonstrations of the operative features of the "TK-II".

We conclude that the pusher of the "TK-II" is for all operative purposes the same as the pusher in the '582 patent's claims 1 and 8, and that the curvilinear path of movement in turn is both the functional equivalent of, and well within the angular range contemplated for the path of movement of the '582 patent. The particular relationships given for the arms of the '582 pusher are descriptive of a means whereby the path of the tomato can be controlled and constrained within certain specified limits over the crucial first third of the cutting phase. It is not significant that one curved piece of metal serves the functions of both leading and trailing arms, since the same

can be said of the '582 pusher.

That the "TK-II" was demonstrated as capable of operating with a straight pusher surface still does not negate the conclusions of infringement, because (1) such a machine was never produced by defendant or Redco, and is not a subject of this suit, and (2) the straight-edged pusher still serves the function of guiding the tomato into the blades at a shallow angle at the commencement of the cutting cycle, which is performing "'substantially the same function in substantially the same way to obtain the same result.'" Graver Tank, supra, at 608.

The "TK-II" uses a curvilinear path of movement. It has been argued by defendant that this is not the equivalent of a path of movement at a shallow angle to the blade surface. The patent makes clear in the specification and description that the first portion of the cutting path is

the crucial phase, for it is during the first third of the slicing action that the skin of the tomato is penetrated. The motion after that is necessary to complete the cutting action, but the process is not fraught with the same problems which are presented in achieving the initial piercing of the fruit. The factual basis of this contention was further demonstrated in court by experts from both sides. The contention was then made by plaintiffs that the curvilinear path of the "TK-II" pusher was within the claim of the patent with respect to this phase of the cutting operation. Defendant's answer was that one cannot speak of an angle to the blade surface for a path which is not straight. We do not agree with the defendnaf. A curved path will not maintain the same angle to the blade surface, but the angular relationship can be determined. In this case the range of angles is well within that claimed by the

'582 patent over the first third of the cutting path. The claims do not specify rectilinear motion, but give instead a range for entry of the tomato into the blades. While the angles may be more difficult to determine for a curved path than for a straight path, they can be determined, as they have been here, and the relevant range of angles is completely covered.

The "TK-II", therefore, with respect to the path of movement of the pusher in relation to the blades, uses the same elements as the '582 patent; namely, the same shallow-entry-angle technique, for the same purpose and in the same manner. The curvature is only slight across the crucial first third of the path. Defendant was not able to demonstrate that the "TK-II" could operate if the angle of approach to the blades was changed drastically. Under all of these circumstances, we find

it completely appropriate to apply the doctrine of equivalents to this aspect of the patent and hold that the "TK-II" infringes the angular relationship element of the '582 patent claim.

An additional factor in our determination was the evidence that the two pushers could be, and in fact had been interchanged, without changing the satisfactory operation of the machines./6

/6 In Graver Tank & Mfg. Co. v. Linde Air Prod. Co., 339 U.S. 605, 609 (1950), interchangeability was described as a significant indicator of the equivalence of two elements:

> An important factor is whether persons reasonably skilled in the art would have known of the interchangeability of an ingredient not contained in the patent with one that was

While it is true there are superficial differences, we believe that the "TK-II" is merely different-looking method of doing that which plaintiff's device achieves in the same manner and for the same purpose. Under the doctrine of equivalents, this constitutes infringement of the '582 patent.

DAMAGES

No evidence has been presented with respect to damages, due to the bifurcated trial format. Pending a determination of that phase of the case, at which time detailed evidence will be presented as to sales of the "TK-I" and "TK-II" slicers, we will also hold in abeyance any determination as to increased damages, allowable under 35 U.S.C. §284, and attorneys' fees, awardable in exceptional cases under 35 U.S.C. §285.

STATUS OF REDCO

An unusual factor in this case was

the failure to join as a party the manufacturer of the infringing machines. We have been asked, however, to make a declaratory ruling as to the binding effect of this decision on Redco, the manufacturer. It is our opinion that such a ruling would be in the nature of an advisory opinion.[7] If a proper case or controversy is brought before us, we will consider the question. Until such time, and in view of the absence of a record on this point, we decline to make any ruling as to Redco at this time on the record before us.

Accordingly, based upon the entire record, including the Findings of Fact, we make the following:

---

[7] See Aetna Life Insurance Co. v. Haworth, 300 U.S. 227 (1937).

IV. CONCLUSIONS OF LAW

1. This Court has jurisdiction over the subject matter of this action and over the parties to this action. 28 U.S.C. §1338 and 35 U.S.C. §281.

2. Venue lies in the Eastern District of Pennsylvania in this matter. 28 U.S.C. §1400 (b).

3. The subject matter of the patent in suit was not disclosed by or anticipated in the prior art. 35 U.S.C. §102.

4. The subject matter of the patent in suit was not obvious to a person skilled in the art at the time the invention was made. 35 U.S.C. §103.

5. The subject matter of the invention was not in public use or on sale in the United States more than one year prior to the date of the filing of the application for the patent in suit. 35 U.S.C. §102(b).

6. The patent specification contains a description of a preferred embodiment

setting forth the best mode contemplated by the inventorfor carrying out his invention. 35 U.S.C. §112.

7. United States Letters Patent 3,369,582 is valid.

8. Defendant's commercial product known as the "TK-I" infringes United States Letters Patent 3,369,582.

9. There is no file-wrapper estoppel applicable to plaintiff's patent.

10. The "TK-II" is in all respects the functional equivalent of United States Letters Patent 3,369,582 claims 1 and 8, and such as such infringes those claims.

11. There is no actual case or controversy before this Court as to the non-party, Redco, at this time.

12. Plaintiff is entitled to have the matter proceed so that damages due it, if any, may be ascertained.

O R D E R

AND NOW, to wit, this 21st day of February, 1975, the defendant in this action will have thirty (30) days from the date of this ORDER to file (1) exceptions, if any, to Findings of Fact made by the Court, with specific citation to those portions of the record which constitute the bases for those exceptions; (2) exceptions to the failure of the Court to adopt those proposed Findings of Fact of defendant which were not so adopted, with specific citation to the proposed Findings and the record citation in support of the m; (3) exceptions, if any to the Court's Conclusions of Law and the reasons therefor; and (4) exceptions to the failure of the Court to adopt any of defendant's proposed Conclusions of Law with citations of the proposed conclusions not adopted.

Defendant shall file a memorandum in support of its position, the memorandum to contain a statement of the factual and legal reasons in support of its exceptions to Findings of Fact and Conclusions of Law and in support of its objections to the Court's failure to make such Findings of Fact and enter such Conclusions of Law defendant has previously submitted to the Court.

Plaintiffs will have an additional fifteen (15) days in which to file their reply memorandum, together with all supporting documentation in opposition to any exceptions of defendant, and to any memoranda filed by defendant in support of its exceptions.

If exceptions are not filed by defendant within the stated thirty (30) day period, defendant will be deemed to have waived any objections to the Findings of Fact and Conclusions of Law, and the matter will

proceed to a determination of damages.

For the purpose of establishing the machinery and procedure to be utilized in connection with the adjudication of damages, in the event no exceptions are filed, a conference will be held on April 1, 1975, at 2:00 P.M. in Room 2102, United States Courthouse, Philadelphia, Pennsylvania. Otherwise, a future schedule, if required, will be contained in the Order ruling upon the exceptions, if any are filed.

It is so ORDERED.

BY THE COURT:

_____
HERBERT A. FOGEL J.
United States District Court

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF PENNSYLVANIA

SYSTEMATIC TOOL & MACHINE COMPANY, et al	:
	:CIVIL ACTION
-vs-	:NO. 70-1708
WALTER KIDDE & COMPANY, INC.	:

OPINION AND ORDER

FOGEL, J. MARCH 19, 1976.

Plaintiffs in this action seek an injunction and damages from defendant for infringement of United States Letters Patent 3,369,582 (the '582 patent), granted to plaintiff Clayton Giangiulio on February 20, 1968, for a "Tomato Slicer". Defendant marketed two machines which allegedly infringed the patent. Plaintiffs, as the holders of the patent developed and sold a machine based on their invention. In a prior Opinion and Order dated February 21, 1975, we upheld the validity of the patent and also found that defendants had infringed it. Because the case was bifurcated, we

focused only on the issue of infringement and did not go into damages. Findings of Fact, Conclusions of Law, and the legal arguments for our conclusions may be found in an Opinion cited at 390 F.Supp. 178 (E.D. Pa. 1975), and 185 U.S.P.Q. 281 (E.D. Pa. 1975).

Subsequent to the filing of that Opinion, defendant filed exceptions to several of our Findings and Conclusions. See Rule 52(b) of the Federal Rules of Civil Procedure. These exeptions related to the dual issues of validity and infringement considered in the initial Opinion. A reply memorandum was submitted on behalf of plaintiffs. We have reviewed the issues and arguments raised by defendant and deny all of its exceptions.

As detailed in the prior Opinon, the validity determination is the preliminary one to be made in an infringement action.

Among the issues which we had to resolve were (1) anticipation of the patent in the prior art; (2) obviousness from the prior art; and (3) the ordinary level of skill in the art. Also significant were (1) the secondary tests of commercial success: long felt need, failure of others, and copying by others; (2) the questions relating to patent invalidation (including proof that the patent was not used commercially more than one year prior to the filing of the patent); and (3) the requirement that the "best mode" for performance be set forth in the patent. 390 F. Supp. at 181.

Once validity has been found, the focus then shifts to infringement. Here the questions include: (1) the scope of the claims of the patent in controversy; (2) the issue of literal infringement of those claims; (3) the applicability of

the doctrine of "file wrapper estoppel"; and (4) the relevancy of the "doctrine of equivalents." Id.

Defendant did not offer any additional evidence in support of its trial contentions in its exceptions to our Findings of Fact. Rather, it pointed to portions of the record which it claimed supported certain of its requested findings. It also amplified some of the legal arguments in favor of its proposed conclusions of law. Defendant's principal contentions are as follows: (1) the patent was anticipated in the prior art; (2) our findings with respect to the secondary tests are not supported by the evidence; (3) the patent did not set forth the best mode, because it did not specify an aluminum pusher; (4) insufficiency of the evidence of sales of one of the defendant's devices during the term of the patent; (5) our failure to find that there

was file wrapper estoppel; and (6) our erroneous finding that defendant's second machine was the equivalent of the patent. Defendant also argues that considerably more weight should have been given to the opinion of its expert, Mr. Karr, and that we should not have placed any reliance unpon the testimony of plaintiffs' experts. No exceptions were taken to forty-one of the sixty-seven findings./1

1. Prior Art and Secondary Tests.

Except for the specific findings dealt with infra, we decline to grant defendant's exceptions for the same reasons which we

/1 No objections were made to Findings 1 to 8, 10, 11, 15, 18 and 23, 25, 29, 30, 42 to 48, 50 to 55, 57 to 59, 61, 62, 54, 65 and 67. Exceptions were lodged against Findings 9 (Background), 12 to 14 (Development of the Patent), 16 & 17 (Patent), 24, 26, 27 & 28 (Anticipation), 31 (Obviousness), 32 to 41 (Secondary Tests), 49 (Best Mode), 56 (TK-I Sales), 60 (File wrapper estoppel), and 63 & 66 (Doctrine of Equivalents).

set forth in the prior Opinion. See 390 F. Supp. at 189-202. It was and is our function as fact-finder to make our determination from the evidence offered by the parties, and, when there is a conflict in the testimony, to resolve the matter based upon our view of the contradictory evidence. Rule 52 of the Federal Rules of Civil Procedure (FRCP). The burden in a civil case of this nature is upon the plaintiff to establish its case by the preponderance of the evidence. Barr Rubber Prod. Co. v. Sun Rubber Co., 425 F.2d 1114, 1120 (2d Cir. 1970), cert. denied, 400 U.S. 878 (1970). The fact-finder is privileged to give such weight as is deemed appropriate to the testimony of witnesses, depending upon the various observed factors including credibility, forthrightness, consistency, and reaction to cross-examination. Rule 52 of the FRCP; Graver Tank & Mfg. Co. v. Linde Air

Prod. Co., 339 U.S. 605, 609-10 (1950). Defendant has not offered any new evidence, but instead urges us to re-evaluate testimony of which we were fully cognizant in arriving at our initial decision. We have given defendant a second bite at the apple, but we are still convinced that our initial findings on the questions of anitcipation in the prior art /2 and the secondary tests /3 are supported by a preponderance of the evidence.

2. Best Mode

The coure of defendant's exception to our finding on the best mode issue is its contention that the original model for the '582 patent, which had a Lexan pusher to force the tomatoes through the blade rack, did not work, until an aluminum pusher was substituted.

/2 Exceptions to Findings of Fact 24, 56, 27 and 28.

/3 Exceptions to Findings of Fact 32 to 41.

In Finding 49 we said:

> The performance of the "Lexan machine" equals that of the aluminum machine when the width of the slots is the same on both machines.

390 F.Supp. at 187. This does not refer to the spacing between the blades (and hence the thickness of a slice) but to the clearance on each side of a blade as it meshes with the pusher arms. Increasing the clearance from that width on the model to that width used on commercial production machines solved the problem of the blades catching on the arms of the Lexan pusher. Since we were satisfied, as stated in Finding 51 (not challenged) that the actual reasons for switching to an aluminum pusher were economic ones, including the higher price for materials, machining and modifications when Lexan is used, the occasional problems Mr. Giangiulio had with the early Lexan-pusher model did not, and still do not affect our findings on the best mode

question.

3. Evidence of Infringing Sales.

In order to find infringement, the court must find an unauthorized use of the patent during the term of the patent. Defendant says it is disputable from the evidence whether any sales of the TK-1 (one of the alleged infringing slicers) were made after issuance of the patent./4 The term of a patent does not commence until the patent is issued, so there could be infringement only if sales took place after issuance. The difficulty with defendant's exception is that this was not a decision on a motion for summary judgment. A disputed material issue of fact would be significant there. Rule 56 of FCRP. Rather it was simply the stuff of which trials are made, and it was our duty to resolve the dispute. Because of the bifurcation order, evidence on specific

/4 Exception to Finding of Fact 56

quantities sold was not permitted. But there was testimony of several of defendant's own employees suggesting at least some sales. As we said in the prior Opinion:

> An accounting, which will be ordered in connection with the determination of damages, will reveal the amount of sales...with certainty.

390 F.Supp. at 198.

4. File Wrapper Estoppel

The coure of defendant's objections to our adjudication relating to the TK-II (the second of the alleged infringing slicers) appears to be to our resolution of the file wrapper estoppel questions. /5 When, as in the instant case, the alleged infringer is not a direct imitation of the patent, resort to the doctrine of equivalents is appropriate; that doctrine holds that a device which uses the essence of the invention, and which differs in insignificant ways with respect to that essence, may

/5 Exception to Finding of Fact 60.

be found to infringe upon the patent. Graver Tank & Mfg. Co. v. Linde Air Prod. Co., 339 U.S. 605, 607-08 (1950). A condition precedent to the patentee invoking the doctrine of equivalents is the patentee's ability to show that the principle of file-wrapper estoppel does not bar his claim. The latter term refers to the limitation of the scope of patent claims which may occur when an inventor seeks to obtain a patent after an initial rejection of his application by the patent examiner. On such occasions, the inventor may narrow the claims sufficiently to distinguish his invention from prior patents, or may narrow them to eliminate unpatentable claims. Regardless of the reason, the effect of such abandonment of the wide scope of the initial application is to estop the inventor from later using the doctrine of equivalents to recapture the breadth of the

patent which he voluntarily abandoned. See Trio Process Corp. v. L. Goldstein's Sons, Inc., 461 F.2d 66 (3d Cir.), cert. denied, 409 U.S. 997 (1972).

Necessarily, because there had been an initial rejection of Mr. Giangiulio's application by the patent examiner, we had to consider the allegation of file-wrapper estoppel very carefully. It was and is our judgment, based upon the exhibits and all of the testimony of the lay and expert witnesses on both sides, that the '582 patent was granted on claims which had not been narrowed from the original application in order to obtain a patent./6 While the rejection had recited unpatentability because of two prior art patents, as well as indefiniteness, the claims in the second submission did not differ significantly

/6 Findings of Fact 59 to 61.

from those contained in the initial application, except insofar as it was necessary to clarify the specific invention for the patent examiner. The reasons for the initial rejection therefore are not dispositive, when the objection of unpatentability was dropped ingranting the patent without any narrowing of the claims. This critical finding on this score led us to conclude that the doctrine of file wrapper estoppel to bar the doctrine of equivalents was not applicable and never could be invoked in the manner it was by plaintiffs.

5. Functional Equivalency.

Defendant also takes exception to our findings that the TK-II is the functional equivalent of the '582 patent./7 Particularly, defendant cites the testimony of its expert that there is not constraint on the tomato by the arm of the TK-II, and that the shallow angle of initiation is maintained for only a small fraction of the movement of the arm.

As we stated in our prior Opinion, the fact questions relating to the equivalence of the TK-II and the patent were the subject of substantial evidence both in weight and in amount, produced at the trial. 390 F. Supp. at 201. We heard from experts on both sides. We also had the opportunity to observe the actual operation of the TK-II firsthand. Our findings were based on all of the evidence presented, and not just on the statements of a single expert. In particular, we were able to observe the path of the tomato and the nature of the forces applied to it by the pusher. Each time the machine was operated, the path followed by a tomato was indentical. Each time, the tomato followed a path which, while slightly curved, was still always at a slight angle to the blades, over the first

/7 Exceptions to Findings of Fact 63 and 66.

third of the tomato's passage through those blades. The arm, which was the only object pushing the tomato, was responsible for guiding the fruit along this predictable path. We therefore found that the TK-II was performing the same function in essentially the same way to accomplish the same purpose. No valid basis has been suggested for us to overturn that finding.

Defendant urges that we change our prior Conclusions of Law because they are inconsistent with its proposed findings of fact. We find no contention which questions the legal principle we applied in determining patent infringement. Since we have declined to accept defendant's proposed findings, and since we instead have reaffirmed our prior findings, our conclusions of law will not be altered.

6. Conclusion.

While no further exposition is required, we believe that it would be well for us to repeat several facets of our original discussion, since it appears from the exceptions which were submitted that defendant is not completely cognizant of the reasons for our conclusions. As we stated in Finding of Fact 30, the basic elements of the '582 patent were well established in the prior art. However, the arrangement of these elements to solve a problem which had evaded solution was not known in the prior art, nor, in our Opinion, had it been disclosed or anticipated. The '582 patent described the problem which it had been developed to alleviate, and explained the cause of prior difficulties encountered in attempting to slice tomatoes in a commercially operable, mechanical, high-speed, single-pass device. The prior art,

both that cited in the patent application, and the similar additional cases cited by defendant in its defendse, did not consider the problem; these machines had been designed to deal with very different varieties of vegetable and fruits. Thus, we found in the '582 patent a new combination of old elements, arranged according to specified requirements for the purpose of solving the particular problems uniquely associated with slicing tomatoes.

The Patent Office and the courts of the United States have recognized on repeated occasions that patentable invention can be found in the recognition of the cause of a problem and its solution, even though the particular solution may seem obvious, once the cause of the problems had been accruately diagnosed. See United States v. Adams, 383 U.S. 39, 51 (1966); Application of Roberts, 470 F.2d 1399, 1401 (C.C.P.A. 1973);Application of Sponnoble, 405 F.2d 578, 585 (C.C.P.A 1969); Zysset v.

Pepeil Bros., 276 F.2d 354, 357 (7th Cir. 1960). On this basis, Mr. Giangiulio's invention was patentable.

We have already disposed o the contention about the applicability of the doctrine of file-wrapper estoppel. With respect to the doctrine of equivalents, we concluded then and reaffirm now that:

> We believe that the "TK-II" is merely a different-looking method of doing that which Plaintiff's [invention] achieves in the same manner and for the same purpose.

390 F.Supp. at 202. See Graver Tank & Mfg. Co. v. Linde Air Prod. Co., 339 U.S. 605, 607 (1950); Kolene Corp. v. Motor City Metal Treating, Inc. 440 F.2d 77, 82 (6th Cir. 1971); Zysset v. Popeil Bros., 276 F.2d 354, 357-58 (7th Cir. 1960).

Defenant's exceptions to the Findings of Fact and Conclusions of Law set forth in our Opinion of February 21, 1975, are therefore denied, and we affirm and

readopt those Findings and Conclusions. An Order to proceed on the question of damages will issue accordingly.

BY THE COURT:

HERBERT A. FOGEL J.
United States District Court

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF PENNSYLVANIA

SYSTEMATIC TOOL & MACHINE COMPANY, et al	:	
	:	CIVIL ACTION
-vs-	:	NO. 70-1708
	:	
WALTER KIDDE & COMPANY, INC.	:	

ORDER

AND NOW, to wit, this 19th day of March, 1976, after consideration of Exceptions filed by defendant to our Findings of Fact and Conslusions of Law entered on February 21, 1975, in the above-captioned matter, and for the reasons expressed in the accompanying Opinion, the aforesaid Exceptions are hereby DENIED, and the Findings of Fact and Conclusions of Law set forth in that Opinion of February 21, 1975, are hereby AFFIRMED and READOPTED: and it is

FURTHER ORDERED that the parties will meet on April 12, 1976 in Room 10614 United States Courthouse, Philadelphia, Pennsylvania,

at 4:30 P.M., for the purpose of establishing time frames and procedures forth disposition of the issue of damages.

IT IS SO ORDERED.

BY THE COURT:

_____
HERBERT A. FOGEL J.
United States District Court

Supreme Court, U. S.
FILED
AUG 9 1977
MICHAEL RODAK, JR., CLERK

IN THE

Supreme Court of the United States

October Term, 1977.

No. 77-75.

SYSTEMATIC TOOL & MACHINE COMPANY, et al.,
Petitioners,

v.

WALTER KIDDE & COMPANY, INC.,
Respondent.

On Petition for Writ of Certiorari to the United States Court of Appeals for the Third Circuit.

BRIEF FOR RESPONDENT IN OPPOSITION.

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IN THE

Supreme Court of the United States

OCTOBER TERM 1977.

No. 77-75.

SYSTEMATIC TOOL & MACHINE COMPANY, et al.,
Petitioners,

v.

WALTER KIDDE & COMPANY, INC.,
Respondent.

ON PETITION FOR WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE THIRD CIRCUIT.

BRIEF FOR RESPONDENT IN OPPOSITION.

STATEMENT OF THE CASE.

This is a normal kind of patent case in which the patent was held invalid for obviousness and lack of invention. The decision of the Court of Appeals and underlying determinations are in full accord with principles established by the Supreme Court. Respondent restates the following aspects of Petitioner's Statement of the Case to make it more accurate.

The Court of Appeals for the Third Circuit did not base its reversal of the District Court only on the testimony of Respondent's expert witness, as Petitioners allege on page 5 of their Petition. Such reversal was based upon all of the determinations prescribed by the Supreme Court in *Graham v. John Deere Co.* 318 U. S. 1 (1966), *Anderson-Black Rock v. Pavement Salvage Co.* 396 U. S. 57, 61 (1969) and *Sakraida v. AG Pro, Inc.* 425 U. S. 273, 279-801 (1976), including scope and content of the prior art, differences between the prior art and the claims at issue, the level of ordinary skill in the pertinent art and whether synergism resulted (10a-16a).[1]

QUESTIONS PRESENTED.

Respondent submits that the questions proposed by Petitioners should be restated as follows:

1. Did the Court of Appeals follow the precepts established by the Supreme Court in concluding that the patent-in-suit was invalid for obviousness under 35 U. S. C. § 103?

2. In concluding that the subject matter claimed in the patent-in-suit was obvious under 35 U. S. C. § 103, did the Court of Appeals find that the combination of known elements claimed in the patent-in-suit lacked synergism?

1. Numbers followed by letter "a" refer to pages of Petitioners' Appendix.

ARGUMENT.

1. In Resolving the Obviousness Issue, the Court of Appeals Reviewed the Basic Inquiries Prescribed by the Supreme Court.

The Court of Appeals carefully reviewed the tests of obviousness under 35 U. S. C. § 103 laid down by the Supreme Court in its recent decisions relating thereto including: *Sakraida v. AG Pro, Inc. (supra)* and *Graham v. John Deere Co. (supra)* (10a, 11a). In so doing, the Court of Appeals held that the District Court's finding as to the level of ordinary skill in the art was clearly erroneous (14a). The Court of Appeals also disagreed with the District Court's finding that Petitioners' combination of known elements results in a synergistic effect (16a). The Court of Appeals, therefore, concluded the patented arrangement was obvious, there was no invention to warrant patentability regardless of commercial success, no synergism resulted (as later discussed herein) and the patent-in-suit was, therefore, invalid (16a).

2. The Court of Appeals Found That There Was No Synergistic Effect Resulting From Petitioners' Combination of Known Elements.

Petitioner inaccurately represents the findings of the Court of Appeals in its statement bridging pages 8 and 9 of the Petition. Petitioner incorrectly states, that the Court of Appeals accepted the finding of the District Court as to the existence of a synergistic result. The Court of Appeals actually determined there was *no* synergistic effect, as evidenced by the following excerpt from page 16 of its decision (16a) as follows:

". . . . Although the synergistic combination of known elements is one factor to consider in determining obviousness, we cannot agree that the district court's findings reveal any more of a synergistic effect than was found in the device to release water on a barn floor from a storage tank in Sakraida, supra. See also Anderson's Black Rock v. Pavement Salvage Co. 396 U. S. 57, 61 (1960). As a matter of law, plaintiff's slicer was 'obvious' ".

3. Synergism Does Not Result From an Arrangement of Old Elements Performing Their Same Old Functions to Merely Produce a More Striking Result.

Petitioner contends that its combination of old elements produces a synergistic result because it slices faster than the prior art. Merely slicing at a higher speed or slicing straighter involves only differences in degree and falls far short of the U. S. Supreme Court's definition of synergism expressed in *Sakraida v. AG Pro, Inc.* (*supra*) and *Anderson's Black Rock v. Pavement Salvage Co., Inc.* (*supra*). Such definition requires an assembly of all old elements to either have a "change in their respective functions" (*Sakraida v. AG Pro, Inc.*, 96 S. Ct. at 1536) or "result in an effect greater than the sum of several effects taken separately" (*Sakraida v. AG Pro., Inc.*, 96 S. Ct. at 1536). Plaintiff's allegations of high speed and straighter slicing action are highly similar to the results found to be lacking in synergism in *Sakraida v. AG Pro., Inc.* (*supra*) in which the Supreme Court stated as follows at page 1537, 96 S. Ct.

"Rather, this patent simply arranges old elements with each performing the same function it had been known to perform, although perhaps producing a more striking result than in previous combinations. Such combinations are not patentable under standards appropriate for a combination patent. A&P Tea Co. v. Supermarket, etc. Co., supra".

4. Petitioner Does Not Contest That the Court of Appeals Was Correct in Finding That Respondent's Expert Witness Represents the Proper Standard of Ordinary Skill in the Art.

The Court of Appeals held that the District Court was clearly erroneous in its determination of the level of ordinary skill in the art and that had it applied the correct standard, it would have found the combination of known elements to have been a routine procedure to one skilled in the art, also lacking in synergism and, therefore, obvious (15a, 16a). Petitioner accepts (page 14 of Petition) that the Court of Appeals did apply the proper standard of ordinary skill in the art. No dispute, therefore, exists as to the admissibility of the testimony of Respondent's expert witness that the patent constitutes a routine, obvious development.

CONCLUSION.

The Court of Appeals faithfully followed the precepts of the Supreme Court in determining that the combination of known elements claimed in the patent-in-suit was obvious and the patent, therefore, was invalid. This case therefore, does not present any important question of federal law, which has not been settled by the Supreme Court. It is also in complete accord with the principle that a patent which lacks invention because of obviousness under 35 U. S. C. § 103 is invalid.

Respectfully submitted,

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